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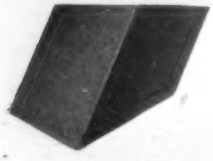

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IRON AND COAL
TRADES REVIEW

Vol. 181 August 19, 1960 No. 4,805

Mines Safety

PUBLICATION of the annual report of HM Chief Inspector of Mines is an event in the life of every colliery manager. It is something that he looks forward to with special interest, for it invariably contains much to help him towards the goal of his ambition—a safer pit. The colliery manager will find much in the comprehensive report for 1959, just published, to assist him to reach the desired goal.

On the general scope of his report, Mr. Rogers refers to an anomaly that developed over the years about the reporting of matters electrical and mechanical. Understandably perhaps, because about 50 years ago mechanical engineering did not present to mining men the novelty of the then relatively new branch of electrical engineering; not only was the specialist post of HM Electrical Inspector of Mines created, but it also became customary for the principal electrical inspector to publish a separate annual report. Its discussion became an outstanding yearly event at meetings of mining electrical engineers.

Many years later, the more extensive use and the greater complexity of mechanical appliances in mines led to the appointment of specialist inspectors of mechanical engineering, but not, oddly enough, to the publication of a separate annual report by the principal inspector of mechanical engineering. But with the ever-growing importance in mining of mechanical engineering, which is no less specialized and certainly no less important to mining engineers than electrical engineering, it became illogical to treat the two branches of engineering differently. In 1954, the publication of a separate report by the principal electrical inspector was discontinued, and the two branches of engineering were dealt with in a general way in the annual report of the Chief Inspector.

This method of dealing with the anomaly has not given satisfaction to the engineers of the industry. As Mr. Rogers says, it is not possible in his annual report to treat electrical and mechanical engineering in the degree of detail which is desirable as a basis for discussion by the specialists concerned. Arrangements have therefore been made for the passages from the Chief Inspector's report to be supplemented by more detailed papers, prepared by the electrical inspectors and inspectors of mechanical engineering, for presentation to the technical associations. This new arrangement should go a long way towards meeting the wishes of engineers—mechanical, electrical, and mining—both in the industry and in the inspectorate.

On the matter of inspectors and inspections, although the number of inspectors in post was higher than it has been for several years, nevertheless it was, surprisingly enough, still 30 short of the authorized complement of 186. On the other hand, the number of inspections stemming from the workmen—6,183 by workmen's inspectors at 710 separate mines, and 4,046 inspections by Safety Board inspectors at 619 mines—showed a small increase over the previous year. So far as the number of inspectors and inspections of all kinds is concerned, these figures do not, we suggest, indicate that the coal mines of this country are under-inspected, more especially when one remembers also the number of inspections called for by statute, as well as the number and activities of the full-time staff in the safety branch of the National Coal Board. Perhaps there is scope for improvement in the quality rather than in the quantity of inspectors and inspections.

A comparison with the previous year shows that the 1959 figure in the "seriously injured" category declined in line with the decrease in the number of manshifts worked. This was not true, however, for the fatal accidents, where the figure, due to the relatively high death roll in the Auchengeich disaster, showed an increase of 21. In commenting on the general trend in accident rates, Mr. Rogers makes the point, first, that the rate of improvement is much slower now than it was 20 years ago—which possibly illustrates merely a simple case of the application of the law of diminishing returns. He adds, however, that during the past seven years the rate of improvement has been so small that it cannot be accepted with equanimity.

Colliery managers will heartily agree with the Chief Inspector in this, and also with his comment that more than one fatal accident every day must not be regarded as inevitable, especially having regard to the fact that most of these accidents are preventable. In this connection, he rightly stresses—as did the Bryan report—the need for a change of attitude of mind on the part of all concerned. But emotional reaction and fine words about a change of attitude of mind towards safety are not enough; positive action is necessary if real improvement is to result. Every man, official and workman alike, must do his duty and immediately call attention to any departure from good practice. Managements on their part must see that such reports are given prompt and appropriate action.

In dealing with falls of ground—still the major

cause of accidents in mines—the report, among many other matters worthy of the close attention of all colliery managers, calls attention to the recent disturbing increase in the accident rate from falls of ground at the working face; and it stresses the need for further efforts to effect an improvement in the standards of roof control and methods of support in this vital area of the mine. With the amount of study and research now being devoted to roof control and supports design, an improvement in the accident rate at the working face should be forthcoming in the near future. In the meantime, however, there can be little doubt that stricter supervision, together with the adoption of better procedures at work, could, as the report indicates, result in substantially fewer accidents.

The comments on accidents arising from the use and handling of explosives make depressing reading. In the words of the report, the accident figures remain at a disappointingly high level. The total number of accidents, slightly higher than in the previous year, was the worst since 1953. The fact that the vast majority arose from either contraventions of regulations or a failure to exercise ordinary caution on the part of the shotfirers is a sad reflection on the results of the improved standards of education and training now available for underofficials in mines; it is a challenge to all concerned.

In relation to ignitions or explosions of firedamp or coal dust, and to fires, the report reveals a most disappointing and, in some respects, a very disturbing position. The figures for the number of incidents, as well as persons killed and injured, in both categories during 1959 show a considerable increase over the previous year. The pointed comments of the Chief Inspector on these incidents and on related matters in the sections of his report dealing with explosions, fires, ventilation, and dust prevention will, no doubt, receive very close study by all concerned in any way whatever with the management of mines.

Altogether, this excellent report contains much that is of value to the colliery manager and mining engineer. If its contents are given the study they merit, and appropriate action is taken where required, much will have been done to raise the standards of safety in our coal mines.

Printers' gremlins are no respecters of persons; they trouble Chief Inspectors of Mines as well as editors of technical journals. The table on page 8 of Mr. Rogers's report makes the situation in respect to falls of ground look worse than it is in fact. The table compares the average number of fatal and serious accidents in the last five years with the figures for the previous five years. The column headings, 1955/59 and 1950/54, are transposed.

Passing Thoughts . . .

IT is a pity that the [Wilson] report shows no awareness of the extent to which foreign coal industries have recognized the need to concentrate effort on problems of utilization, and of the gains they have experienced from the integration of a wide range of operations in large complex units in their own hands.—The Times.

> *In view of the glut of "natural" oil throughout the world, the [Wilson] committee is undoubtedly right in cold-shouldering the huge development costs that must accompany coal into oil—Sheffield Telegraph.*

Coal *v.* Oil. In an article on the subject, the Mining Journal comes to the conclusion that petroleum or oil can never rival coal as a steam fuel, except for experimental purposes, where cost and danger are of no consideration.—From a report in the Cardiff Times of August 31, 1866.

> *The miners can hardly be condemned for striving to better their wages and working conditions; at the same time it is not irrelevant to point out that in the long run the fruits of their endeavours in this direction may well be fewer, if better-paid, jobs. And if a further consequence is a general rise in the cost of living . . . what happens to the purchasing power of that extra 5s.?—The Glasgow Herald.*

Trade unionists, recognizing in wild-cat stoppages a threat to their own good name and to the livelihood of many workers, should band together to fight the evil in their midst and to eradicate a source of weakness both to the labour movement and to British industry.—Yorkshire Post.

> *We are unconscious victims of out-moded sequences and patterns of living which keep us wholly unprepared for our forthcoming adventure in free time.*—DR. ALEXANDER REID MARTIN, *chairman of the American Psychiatric Association's Committee on Leisure-time and its Uses.*

The number of serious outbreaks of fire in factories where the fire risk is high is comparatively small; it is in the wide range of industries where the fire risk is less obvious that too little attention is paid to fire precautions.—National Inspection Council for Electrical Installation Contracting.

> *When I rekindled the fire, black carbon-filled fumes almost choked me, made it necessary to re-wash a line full of wet clothes, and for me to have a bath and shampoo before recovering my customary colours. Re-stock with coal at summer prices indeed!—Letter in the Yorkshire Post.*

I'm not interested in the size of satellites or the accuracy of missiles fired off by different nations, but only in the rate of applying existing scientific methods to underdeveloped countries.—PROF. P. M. S. BLACKETT, Professor of Physics, Imperial College of Science and Technology, London, addressing the International Conference on Science, in Israel.

A Linz-Donawitz (LD) steel plant has been ordered from the Austrian State-owned concern VOEST by the Companhia Siderurgica Paulista, for its steel complex at Santos, Brazil. The steelworks is to have an initial capacity of 500,000 metric tons and the whole unit is to be built by a Franco-Austrian consortium consisting of Delattre et Frouard, Cetig, and VOEST.

Welsh Pits Crisis

SHORTAGE OF MINERS MAY LEAD TO CLOSURES

SERIOUS shortage of miners in South Wales may result in the closure of some pits. The South Western Divisional Coal Board not only faces an alarming drift of men from the industry, but must recruit between 6,000 and 7,000 miners before the end of the year to keep the pits fully manned. Talks are being arranged between leaders of the divisional board and the National Union of Mineworkers in the coalfield to try to solve the acute manpower crisis.

A complete change has taken place since pits were closed 18 months ago because of a coal glut. The challenge now facing the South Wales coalfield is to recruit enough workers to keep the pits open and avoid a coal shortage.

The coalfield is already falling behind in its output. Although the divisional board is reluctant to close pits which still have a useful working life, the lack of miners may compel them to do so to enable miners to be transferred to big new pits where large-scale production is possible.

Ex-miners Returning

The number of miners in the division—predominantly South Wales but including the small Forest of Dean and Somerset coalfields—has fallen in a year by more than 9,000 and now stands at about 86,000. This is drastically short of the target of between 90,000 and 94,000 officially set by the NCB for 1965.

There is an encouraging increase in the recruitment of youngsters and in the number of ex-miners re-entering the industry, but this has been offset by a national agreement to retire men over 65 years of age. It has cost the division more than 3,000 workers.

After a meeting in Cardiff last week of the South Wales miners' executive, Mr. D. D. Evans, the Area secretary, said that the drift from the mines would not stop until higher wages, fewer working hours, and longer holidays were offered. The executive criticized the "trivial" wage increase of 5s. a week for day wage workers awarded last week, and said that the miners' claim of 12s. should have been met in full.

The South Wales Area is asking the national executive to call a special conference to decide how the union should press for fewer working hours—a seven-hour day for underground workers, and a 40-hour week for surface men—and a substantial wage increase.

Following a meeting in Cardiff on Tuesday between the South Western Divisional Coal Board and the South Wales miners' executive, a joint statement said that both sides recognized the serious manpower problem and agreed to do everything possible to arrest the wastage of recent months. Referring to suggestions that the board might contemplate closing certain pits so that the men might be transferred to others, which could then be fully manned, the statement said that this was not the solution, and was unnecessary "at present."

CHANGES in export licensing control resulting from amendments to the list of goods subject to embargo become effective on Monday. The main changes are that export control is removed from magnesium oxide, while the scope of export control is reduced in respect of refractory goods, nickel, alloys, and germanium.

Yorkshire Pits Need 8,000 Recruits This Year

RECRUITMENT campaign is to be launched by the North Eastern Divisional Coal Board in an attempt to fill 8,000 vacancies at its pits before the end of the year. Greatest manpower shortage is being felt by two pits in the Doncaster area, Rossington and Yorkshire Main (Edlington), which have between them 1,040 places unfilled.

In the Scottish coalfield, the latest Area to indicate that recruits would be needed is East Fife, where extra miners at the rate of about 800 a year will be required soon. Mr. T. D. M. Scrimgeour, Area general manager, said last week: "We have succeeded in offering redundant miners jobs caused by wastage. Now redundancy is almost at an end, but the wastage continues. Soon, the jobs will have to be filled by recruitment."

Concern at the low number of boys entering the mining industry was expressed by Mr. L. Haywood, industrial relations officer for the No. 1 Area of the East Midlands Divisional Coal Board, at a prize-giving last week at Grassmoor training centre, Derbyshire. Instead of the required intake of over 250 boys per course, he said, the centre was now getting about 150.

"So far we have only 90 for the next course, and I do not think the figure will exceed 130. This, if it continues, is going to cause a serious manpower problem in the future." One of the difficulties, said Mr. Haywood, was that of getting boys and men to enter the industry when they could see pits closing round their own villages. They did not realize that this was merely the transfer of workers from one pit to another. Output was going up all the time.

Raw Material Prices Steady in July

INDEX of the Board of Trade for basic materials and fuel used in manufacturing industry (1954 = 100) fell from 102.3 in June to 102.1 in July. The wholesale price index for materials and fuel used in the electrical engineering industry rose by 0.1 per cent. to 117.2 in July, but the index for mechanical engineering materials was lower at 126.5 against 126.8 because of the reduced price of rubber.

The overall wholesale price level of all manufactured products was only slightly changed in July from the average of the two preceding months.

Obituary

Death of NCB's Alloa General Manager

GENERAL manager of the Alloa Area of the Scottish Divisional Coal Board, Mr. William Summers, has died at the age of 58. A native of Lanarkshire, he started work at Over Dalserf and Woodside collieries (Lanarkshire).

MR. WILLIAM SUMMERS

In 1927 Mr. Summers gained his first-class colliery manager's certificate, and was appointed undermanager with the Arden Coal Company, Limited, Coalburn, in the same year. He subsequently became manager with Jas. Nimmo & Company, Limited, at Holytown and Canderrigg collieries. He was appointed manager of Cardowan Colliery in 1942 and a year before vesting date became agent of the Cardowan Group.

In 1948 he was made sub-Area production manager of the Prestwick sub-Area and on the subdivision of the Ayr and Dumfries Area in January, 1952, he was promoted deputy Area production manager for the West Ayr Area. In September of that year he was appointed Area production manager of the Central West Area, and became assistant Area general manager of the Alloa Area in 1957. In the following year he was appointed general manager of the Area.

Mr. Summers was a past president of the Scottish branch of the National Association of Colliery Managers.

MR. W. L. DUMBLE

THE death has occurred of Mr. WILFRED LONSDALE DUMBLE, chief engineer of the No. 3 Area, Durham Divisional Coal Board. He was 56. Mr. Dumble was connected with the mining industry all his working life. From boyhood until vesting date he was employed by Horden Collieries, Limited, becoming its deputy chief engineer.

On nationalization, Mr. Dumble was appointed a group engineer, later becoming assistant Area chief engineer (mechanical). He took up his last position at the end of 1955. A member of the Institution of Mechanical Engineers, the Institute of Fuel, and the Institution of Mining Engineers, he was a Fellow of the Association of Mining Electrical and Mechanical Engineers.

Mr. V. L. NICHOLLS, a director of Grazebrook Foundry, Limited, of Dudley, died last weekend at the age of 45. Before joining the Dudley firm in 1944, he was associated with Smethwick Drop Forgings, Limited.

The death occurred on Thursday of last week of Mr. JOHN GOOSTREY, formerly an Area land sales supervisor for the NCB in Lancashire.

Mr. FREDERICK W. THOROGOOD, works superintendent and a special director of George Mann & Company, Limited, printing machine manufacturers, of Leeds, has died at the age of 48.

The death has taken place of Mr. ANDREW HUTTON HANSON, founder and managing director of A. H. Hanson, Limited, engineers, makers of metal pressings, etc., of Keighley (Yorks).

Mr. ARTHUR LONSDALE HETHERINGTON, from 1922 to 1943 assistant secretary of the Department of Scientific and Industrial Research and administrative adviser to the British Coal Utilisation Research Association in 1943-44, died on Sunday at the age of 78.

Mr. WILLIAM GORDON MARTIN, oversea manager of A. Reyrolle & Company, Limited, manufacturing electrical engineers, of Hebburn-on-Tyne has died at the age of 57. He joined the company about 30 years ago and before taking up his last position two years ago was outside manager for Scotland.

Former manager of Sadler & Company, Limited, chemical manufacturers, of Middlesbrough, Mr. ARTHUR J. CADDICK, has died at the age of 74. He began his career with Acklam Ironworks, Limited, and North-Eastern Steel Company, Limited. He then spent some time in the Spanish chemical industry and on his return to this country became coke-oven and by-products manager of the South Durham Steel & Iron Company, Limited. Mr. Caddick retired some years ago.

Chairman of G. N. Haden & Sons, Limited, London, heating and ventilating engineers, for many years, Mr. GEORGE NELSON HADEN has died at the age of 60. After experience in America he joined the company in 1923, becoming a director in the following year and chairman in 1938—a position he held until his recent retirement. Mr. Haden was president of the Institution of Heating and Ventilating Engineers in 1938 and was awarded its gold medal in 1959 "for services of outstanding value over a long period."

INDUSTRIAL INJURIES FUND SURPLUS

ESTIMATE that the capital assets of the Industrial Injuries Fund will eventually exceed the fund's liabilities by £617,000,000 is made in the report of the Government Actuary on the second quinquennial review, published on Saturday. The estimate of assets is calculated taking the present value of future contributions and Exchequer supplements, together with the fund of £205,000,000 at March 31, 1959, and the value of future excess interest and appreciation on the "dated" securities.

The Government Actuary's calculation of the excess of the fund's income over expenditure in the next 40 years shows that this will never be less than £9,000,000 and was £23,200,000 in 1959-60.

ENTIRE SHAREHOLDING of the South African owned Rhodesian concern of steel merchants, S.A. Clay & Steel (Rhodesia), Limited, has been acquired for about £600,000 sterling for British clients, states Robert Fraser & Partners, Limited, investment bankers of London.

Company News

WELLMAN'S BID OPPOSED

£1,920,000 Offer for Gibbons (Dudley)

DIRECTORS of the Wellman Smith Owen Engineering Corporation, Limited, are to make a direct offer to ordinary shareholders of Gibbons (Dudley), Limited, manufacturers of refractories and coal carbonizing plants, of Dudley (Worcs), for their shares on the basis of one Wellman £1 unit plus £11 10s. cash for every four Gibbons £1 shares. Based on the closing price on Thursday of last week of 153s. 1½d. for the Wellman shares, the offer is worth about 95s. 9d. per Gibbons' share, giving the deal a value of about £1,920,000.

Wellman Smith Owen states that the direct approach is being made because no agreement was reached in discussions with the Gibbons' board held with a view to finding a mutually agreeable basis for that company to join the Wellman group. The Wellman directors add that the acquisition would be of advantage to both companies, as their products are mainly complementary. If the offer goes through, they intend that the present directors and senior staff of Gibbons should continue to manage its business.

The directors of Gibbons state that having taken the advice of S. G. Warburg & Company, Limited, they have informed Wellman Smith that they consider the terms of the proposed offer inadequate, and therefore would not recommend shareholders to accept. The company promises a detailed statement shortly.

Laycock Engineering Offer for Hardypick

DETAILS of the bid for Hardypick, Limited, mining tools and machinery manufacturers, of Heeley, Sheffield, by Laycock Engineering, Limited, Sheffield, are announced. The offer for the whole of the issued 30,000 7 per cent. cumulative preference £1 shares and 70,000 £1 ordinary is 30s. for each preference, and 65s. for each ordinary.

Accepting shareholders will have the right to receive the following further dividends in respect of the year ended June 30, 1960—on the preference 3½ per cent., less tax, and on the ordinary 12½ per cent., less tax. Offers are open until September 2 or such later date, not later than September 23, and is conditional upon 90 per cent. acceptance, or such lesser amount, as Laycock may agree of each class of capital.

In the event of Laycock's obtaining control, it intends to carry on the existing business and retain all the present directors, staff, and workpeople.

POWELL DUFFRYN, LIMITED—Consolidated profits increased from £2,696,586 to £3,121,064 and net profits to £1,181,125 (£1,075,560). The dividend is held at 16 per cent.

HARLAND ENGINEERING COMPANY, LIMITED—An associated company, Harland Engineering (Australia), Limited, has acquired McKinlay Fletcher, Limited, of Sydney, which represented the UK concern in Australia before Harland's Australian associate was formed 18 years ago. McKinlay Fletcher has continued as agents for the Australian company.

MOLER PRODUCTS, LIMITED, manufacturers of heat insulating products, of Colchester (Essex)—Final dividend of 10 per cent. makes 16¾ (15) per cent. for the year ended June 30, 1960. Group profit fell to £50,307 (£59,841), after tax of £49,859 (£50,578).

HOLMAN BROS. LIMITED, mining, quarrying, and pneumatic plant manufacturers, of Camborne (Cornwall)—Oversea sales for the year to March 31, 1960, show an improvement over last year, and now represent 69.7 per cent. of the total group turnover, states Mr. P. M. Holman, chairman.

STANCROFT, LIMITED, manufacturers of sheet metal working machinery, of Birmingham—Final dividend of 15 per cent. makes 25 (20) per cent. for the year ended March 31, 1960. Group net profit rose to £46,018 from £24,696, after tax of £31,680 (£29,490).

C.A.V. LIMITED—The company has acquired the whole of the share capital of Bryce Berger, Limited, manufacturers of fuel injection equipment, etc., of Staines (Middx), from the Hawker Siddeley Group, Limited. Bryce Berger will continue to operate as a separate company.

G. BRADY & COMPANY, LIMITED, makers of shutters, fireproof doors, and lifts, of Manchester—Final dividend is raised by 2½ per cent. to 27½ per cent. to make 42½ (40) per cent. for the year ended March 31, 1960. There is a net profit of £201,616 (£183,638), after tax of £196,122 (£186,881).

RIPPINGILLES, LIMITED, engineers and stove makers, of Birmingham—Net profit for the year ended March 31, 1960, fell to £38,166 from £152,438 after tax of £34,600 (£145,439). The dividend is cut from 2s. 3d. to 6d. per 5s. ordinary share. The company last March announced that production of drip-feed oil heaters had temporarily ceased.

GLACIER METAL COMPANY, LIMITED, bearing and die-casting manufacturers, of Wembley (Middx)—Issue of £750,000 6½ per cent. debenture stock, 1980-85, is announced, to finance commitments for capital expenditure and for general development and expansion. The company intends in due time to raise further money by a rights issue of ordinary shares.

WARNER & COMPANY, LIMITED, makers of special pig-irons, of Middlesbrough—The capitalization of £80,000, standing to the credit of the general reserve, for the purpose of making a bonus issue of one fully paid ordinary share for each ordinary share held on September 20 is recommended. The £1 ordinary shares are to be subdivided into 5s. shares. An increase in

the ordinary dividend to 15 per cent. is made with a view to obtaining a better balance between interim and final payments.

E. AUSTIN & SONS (LONDON), LIMITED, metal merchants and refiners, and solder makers, of London, E.9—Group net profit for the year ended March 31, 1960, was £16,173, compared with a loss of £73,619. The dividend is 4 (nil) per cent. Mr. D. J. R. Austin, chairman, states that the directors are still considering ways of broadening the field of activities.

HACKBRIDGE & HEWITTIC ELECTRIC COMPANY, LIMITED—Amount of business secured during the past year will ensure that for the next 12 months and beyond the company will be busy, states Mr. Anthony M. Browne, chairman. He feels confident that "shareholders will have no reason to be disappointed with the board's report in 12 months' time."

CONTACTOR SWITCHGEAR, LIMITED—The business of Radio-Aids, Limited, Watford, has been bought for £10,000. The business of the two companies is supplementary and the amalgamation should result in broadening the scope of operations. Mr. E. L. Gardiner will continue as managing director of Radio-Aids, and Mr. H. Rayner and Mr. A. V. Lawry have joined its board.

S. G. BROWN, LIMITED, precision instrument makers, of Watford (Herts)—The company has now formally become a subsidiary of the Hawker Siddeley Group, Limited, 51 per cent. of its capital having been acquired by the Hawker group's wholly-owned subsidiary, de Havilland Holdings, Limited. The remaining 49 per cent. is held by the American Bosch Arma Corporation. Acquisition of the company from the Admiralty was first announced in June.

NORTON INDUSTRIES, LIMITED, ironfounders, engineers, and scrap merchants, of Wolverhampton—Interim dividend is being raised from the equivalent of 2½ per cent. to 4 per cent. in respect of the year to October 31, 1960. The increase is based on improved profits and the decision to reduce the difference between the final and interim dividends, the directors state. A total equivalent to 10 per cent., plus a capital distribution equal to 1¼d. per 2s. share, was paid for 1958-59.

DESIGNEX (COVENTRY), LIMITED, production equipment design consultants and precision engineers—The company has been acquired by the Dowty Group, Limited, for whose member companies it already acts as sub-contractor. Mr. J. C. G. Wegerif is chairman of the company, with Mr. E. G. Gibbons as managing director. The rest of the board consists of Mr. W. Gibbons, Mr. Lionel Harper, Mr. W. Handley, and Mr. J. D. Knight. Mr. E. R. Beattie has been appointed secretary.

KIRKSTALL FORGE ENGINEERING, LIMITED—Dividend is maintained at 12½ per cent. for the year to June 30, 1960. with an unchanged final of 7½ per cent. Profit was £266,938, subject to tax of £110,310, leaving a net profit of £156,628. The directors state that the bases of valuation of stock and work in progress and of depreciation of fixed assets have been revised, and if the new bases had been in use at June 30, 1959, the profit for that year would have been £55,059, subject to tax of £9,432, leaving a net profit of £45,627.

TAP & DIE CORPORATION, LIMITED—Final dividend of 11½ per cent.—against a forecast of not less than 10 per cent.—plus a tenth year bonus of 2½ (nil) per cent. makes 20 per cent. for the year ended May 31, 1960, on the capital as increased by shares issued against acquisitions, compared with 16 per cent. Group net profit, including the profits of the newly acquired subsidiaries, the International Twist Drill Company, Limited, and John Harris Tools, Limited, for periods of up to 17 months, increased from £295,959 to £807,707, after tax of £319,784 (£143,765).

GEORGE KENT, LIMITED, industrial instrument and automatic control manufacturers, of Luton (Beds)—Record profits, maintenance of 17 per cent. dividend as forecast on capital increased by a three-for-eight rights issue, and a proposed one-for-one scrip issue are announced. Following the unchanged 5 per cent. interim, the final is held at 12 per cent. for the year to April 2, 1960. The parent company's profit, after tax, is £381,742, compared with £278,586, and the group profit is up to £307,061 from £226,388. Charge for estimated UK income tax for 1960-61 is £326,046.

Deutz Plant for Egypt to Manufacture Tractors

CO-OPERATION between Egypt and the German engineers, Klockner-Humboldt-Deutz, of Cologne, is to be further expanded. Dr. Sidky, the Egyptian Industry Minister, is to visit Germany in October to continue negotiations for the manufacture in Egypt of Deutz tractors.

The German concern signed an agreement with the United Arab Republic Five-Year Plan Organization last year to erect Egypt's first diesel engine and goods vehicle factory to manufacture lorries. The first phase of the building of the El Nasr Automotives Manufacturing Company, SAA, Heluan, has now been completed.

The plant now has a capacity of 2,500 lorries and buses. Shubra Diesel Cairo began assembling Deutz stationary diesel engines recently.

Malcolm & Allan Amalgamation

BUSINESSES of Malcolm & Allan (London), Limited, and Cable Jointers, Limited, have amalgamated under one management. They are now operating from 229, High Street, Acton, London, W.3 (telephone ACOrn 7811). Both are companies in the Metal Industries, Limited, group. Mr. E. J. Daws is now managing director of the two companies, which still retain their own names and serve their own particular branches of industry.

The companies between them cover the whole field of electrical contracts, cable jointing, wiring, overhead lines and complete industrial schemes. The integration is designed to broaden the activities of the two concerns and to develop to the point of establishing branches in the provinces.

New AEI East Anglia Office

FOLLOWING the integration of the former district and branch office systems of Siemens Edison Swan, Limited, and W. T. Henley's Telegraph Works Company, Limited (both now part of AEI Woolwich group), a new district office has been formed. Known as the East Anglian district office, it represents the Woolwich group in Norfolk, Suffolk, and the Northern half of Essex.

Mr. S. L. Crafford, who has been appointed manager of the East Anglian district office, will for the present operate from the Colchester office in this capacity.

IRON AND STEEL TRADE

HOLIDAYS are having a marked effect on steel production, and although the July rate of output was well above that for July, 1959, and August will probably show a similar improvement, the real drive towards the record figures forecast for the year will not begin until next month. The present heavy demand for almost all types of steel is running parallel to increasing capital development within the industry itself, so helping to add to the extreme pressure, particularly for heavy finished materials. It is abundantly evident that crowded order-books will demand capacity outputs from the rolling mills when the holiday period ends.

Pig-iron

Production of pig-iron is maintained at high levels, the greater proportion (over 80 per cent.) being in basic steelmaking iron, and producing furnaces have no difficulty in disposing fully of their makes. The supply of scrap in most parts of the country is insufficient to satisfy in full the requirements of the steelworks, so that their ingot production depends mainly on the pig-iron supply.

The low-phosphorus irons are in biggest demand, particularly by the engineering and speciality foundries, which are also making appreciable calls on hematite. Together with the refined irons no difficulty is experienced in obtaining supplies and the high-phosphorus irons are also plentiful.

Ferro-alloys

The demand for most items has now returned to a reasonable level, although ferro-silicon has not yet attained the high level of recent months, due no doubt to the holiday interruption. Ferro-chrome is active, and ferro-manganese and silico-manganese are receiving moderate support. There is a fair demand by certain consumers for supplies of ferro-sulphide and ferro-phosphorus.

Steady attention is given to ferro-niobium and ferro-titanium, while ferro-vanadium and ferro-molybdenum are in good demand. Little improvement is noted in the call on ferro-tungsten.

Semi-finished Steel

Most of the re-rollers have plentiful supplies of steel semis on hand and in some instances deliveries from home steelworks have been curtailed until these tonnages have been reduced. Orders for small bars, light sections, and reinforcing rods are sufficient to enable the re-rollers to increase their present high outputs—if only sufficient suitable labour were available.

Home steelworks are able to meet the present call for billets, blooms, etc., without difficulty and increased tonnages can be supplied as the need arises.

Finished Steel

Requisitions for joists, angles, channels, etc., are at a high level, but production is below its peak because of holidays and overhauls. With the majority of the mills already booked up for some months ahead only a very few sizes are available for which additional tonnage can be accepted. Fairly substantial quantities are being placed for forward delivery, but some mills are refusing further commitments until they have made inroads into their existing obligations.

The demand for plates shows no signs of abatement, but there is a little easing in meeting the requirements for thinner gauges. Substantial supplies from the Continent and America are helping to relieve the pressure for cold reduced sheets.

Good commercial quality bright drawn bars and cold drawn strip are fairly easy to obtain, but bright drawn bars in free cutting and alloy qualities are scarce owing to the shortage of the special steels required. Reasonable delivery dates are being quoted for black sheets and hot rolled strip, but those for cold reduced strip and galvanized sheets, both flat and corrugated, are extended.

Steel Deliveries in UK Rise 24 Per Cent.

FEATURE of the growth in steel production, which in July was 22 per cent. higher than a year earlier at a weekly average of 391,400 tons, has been buying by the building and constructional engineering industries, with their substantial and increasing order-books and their high level of activity in the summer months. Estimates prepared by the Iron and Steel Board show that deliveries of finished steel to these industries in the second quarter of this year were at a weekly average of 42,300 tons, against 30,000 tons a year ago, an increase of 41 per cent. Of the other main groups, only the wire manufacturers increased their offtake at a larger rate (by 48 per cent.).

There was still a substantial rise in deliveries to vehicle manufacturers, who took 16 per cent. more than a year earlier. In mechanical engineering the increase was not much over 3 per cent. Shipbuilding was the only main steel-consuming industry whose steel deliveries actually dropped between the second quarters of 1959 and 1960, its weekly average rate being down from 12,700 tons to 12,200 tons. Total deliveries to the home industry alone were 24 per cent. above the second quarter of 1959.

On the basis of the preliminary estimate of consumers' stocks, the Iron and Steel Board calculates that in the second quarter of the year UK steel consumption totalled 3,851,000 tons compared with 3,798,000 tons in the first quarter. Allowing for seasonal variations, the increase is put at about 2½ per cent. above the first quarter, and 12 per cent. above the second quarter of 1957.

AFTER consultations with officials of the National Coal Board, Peterborough Joint Education Board has decided to install oil heating in its new extension to Peterborough Technical College. The Joint Education Board considered that it would not be able to find the necessary labour to clear the ash which would result from burning solid fuel.

Personal

A presentation was made last week to Mr. GEORGE FOX on the completion of 50 years' service with the Delta Metal Company, Limited, Birmingham.

Mr. WILLIAM GUEST, chargehand in the tubular bending shop of Stewarts and Lloyds, Limited, retired on his 65th birthday after 51 years' service with the company.

Institute of Fuel has elected Dr. W. A. MACFARLANE, managing director of the national industrial fuel efficiency service, as the next president. He takes office on October 11.

Dr. A. A. GRIFFITHS, FRS, who has been chief scientist to Rolls-Royce, Limited, for 21 years, has retired from full-time service with the company, although he will continue to act as a consultant.

After 40 years with Birtley Engineering, Limited, Mr. RUEBEN BELL, projects engineer, has retired. He has served as president and vice-president of the North Durham branch of the Association of Engineering and Shipbuilding Draughtsmen.

Mr. E. O. CHAPMAN, sales manager of Gent & Company, Limited, the Leicester electrical engineers, is shortly to visit New Zealand, Australia, Pakistan, Kenya, Rhodesia, and the Union of South Africa. He will be away for about two months.

Mr. LLOYD F. ELKINS, a 1934 graduate of the Colorado School of Mines, has been nominated president-elect of the American Institute of Mining, Metallurgical, and Petroleum Engineers. He will take office as president in 1962. The AIME, with 36,000 members, is the nation's largest mineral engineering organization.

FRAU AMÉLIE THYSSEN, principal shareholder in the August Thyssen-Hütte steel group, is the first woman in Germany to receive the Grand Cross of Merit with star and sash of the Federal Order of Merit. The award has been made for Frau Thyssen's part in the setting up of the Fritz Thyssen Foundation for the promotion of science.

The Minister of Labour has appointed the EARL OF VERULAM as chairman of the National Advisory Council on the Employment of the Disabled in place of Sir Harold Wiles, who has resigned. Lord Verulam is chairman of Enfield Rolling Mills, Limited, and of the Engineering & Lighting Equipment Company, Limited, and a member of the council of the Industrial Welfare Society.

Professor of Aircraft Propulsion at the College of Aeronautics, Cranfield, Prof. AUSTIN GEOFFREY SMITH, has been elected the first holder of the Hives Chair of Thermodynamics, endowed by Rolls-Royce, Limited, in the University of Nottingham. He will be the head of the department of mechanical engineering in succession to Prof. J. A. Pope. Most of Prof. Smith's work has been on gas turbines, particularly jet engine aerodynamics.

New Chair of Gas Turbine Technology at the Technological University of Delft, Holland, has been accepted by Mr. R. W. STUART MITCHELL. To take up his new duties he has relinquished his appointment as group chief engineer of Associated British Engineering, Limited, but will retain his connection with the company as technical advisor for a period of two years in the first instance. At the end of that period the arrangement will be reviewed in the light of his commitments to Dutch industry.

COAL SHIPMENTS from the Wear in the first six months of the year increased by 78,091 tons to 1,206,010 tons.

NCB Scottish Division's New Marketing Director

MARKETING director of the Scottish Division of of the National Coal Board, Mr. W. H. Craig, is to retire in October due to ill-health, it is announced. He will be succeeded by Mr. William MacLeod, at present deputy marketing director (commercial), Scottish Division.

Mr. Macleod in 1918 joined the firm of William Mathwin & Son, Limited, coal exporters, and worked for a time in its Paris office. From 1931-34 he was with the Glasgow office of the Fife Coal Company, Limited, and in 1934 he joined Bairds & Dalmellington, Limited, where he was sales manager. On vesting date he became senior deputy marketing director of the Scottish Division of the Coal Board. He has also been chairman and vice-chairman of the Scottish Committee of the Coal Utilisation Council.

Mr. Craig joined the Fife Coal Company, Limited, in 1924, becoming sales manager in 1930 and a director in 1937. Before nationalization he represented the Scottish coal owners on a number of sales committees. In September, 1946, he was appointed the first marketing director of the Scottish Division of the Coal Board, and in that position has been responsible for setting up the board's marketing and regional sales organization in Scotland. In 1957, he was president of the Coal Trade Benevolent Association of Scotland.

Rubery Owen Wheelmaking Plant in South Africa

FIRST £400,000 sterling section of its new £1,250,000 factory at Port Elizabeth is being installed by Ruberowen (South Africa), Limited, an associate of Rubery Owen & Company, Limited. Semi-automatic wheel-manufacturing plant will make 300 car wheels per hour at a cost somewhat higher than in Europe. Press tools for each type of wheel cost £2,000.

Ruberowen will start next year making petrol tanks, rear axle cases, and front suspension units, and in the third stage chassis frames will be made. Part of the company's programme will be carried out at Roodepoort, in the plant of Metal Pressings, Limited, formerly a subsidiary of Vanderbijl Engineering (Vecor), Limited, which has a 51 per cent. interest in Ruberowen, while the UK company owns 49 per cent.

The company hopes to develop exports in the Far East and South America.

Rising Demand for Steel in Canada

INCREASING demand for steel in September—due to the motor car and farm-equipment makers starting their 1961 production runs—is reported by Steel of Canada, Limited, the country's largest producer. Mr. Lee Craig, vice-president in charge of sales, said: "We feel that the low point in steel output has been passed and we can look for a pick-up in demand."

During recent weeks both Stelco and Dominion Foundries plants at Hamilton, Ontario, have been producing at above the national rate of between 77 and 81 per cent.

African Notes

STEEL SHORTAGE

Home Rationing and Exports Cut in South Africa

STEEL users in the Central African Federation have been advised to seek supplies from sources other than South Africa. The South African Trade Commissioner in Salisbury, Mr. W. A. Barnard, said that steel shortage in the Union was so serious that even South African consumers were being severely rationed, and export promises of steel to oversea countries made when ISCOR supplies were freely available had been stopped.

Mr. Barnard said that despite these restrictions, South Africa would continue as far as possible to supply the Federation with steel which could well be used by its own manufacturers, and at a price well below that realized for South African steel in oversea markets.

Mr. F. S. Owen, the Federation's Minister of Commerce and Industry, told the Transport Manufacturers' Association that a good deal of the 30,000 tons of steel a year usually drawn from the Union had already been received, and the present shortage was expected to be only temporary until ISCOR reached its full production programme "some time next year."

Developments at Que Que

Black and galvanized sheets (flat and corrugated) and steel plate up to ¼-in. thickness should be in production at the Que Que works of the Rhodesian Iron & Steel Corporation by the end of 1960 or early 1961. This development will add sheet and light plate to the steel products—billets, rounds, squares, angles, channels, flats, tubes, plain and barbed wire—already available for fabricators and manufacturers from RISCOM, Stewarts and Lloyds, and Lancashire Steel, in this area. Also during 1960 it is expected that the rod mill of Lancashire Steel (Rhodesia) (Pvt), Limited, will be in production in Que Que.

Mr. A. W. Edward, export director of the Morgan Crucible Company, Limited, recently opened a new plant for the Morgan Crucible Company SA (Pty), Limited, at Tulisa Park, near Johannesburg.

The 3 per cent. *ad valorem* duty on imports into South Africa of iron and steel sheets, coated with tin, is suspended until October 31 this year, in terms of a notice in the Government Gazette Extraordinary No. 6484.

Coal merchants in Johannesburg are pressing the Railway Administration for trucks to enable them to keep up supplies. The merchants are hard put to it to satisfy customers. Demand has risen sharply in the past few weeks, and some merchants say the railways find it difficult to keep up an adequate flow from the pitheads. Similar difficulties are being met in Pretoria. Railway authorities say that railings of coal have been kept at a high level throughout the winter, and early in June a record was set by moving 500,000 tons from the Witbank area in a week. It is several years since the Rand suffered a shortage of domestic and power-station coal.

A special commission appointed by the Government Mining Engineer has upheld the appeal of South African Coal Estates, Limited, against the order by Mr. W. T. Dalling, Inspector of Mines, to close down five sections of the colliery at Witbank. Closure of the sections had been ordered by Mr. Dalling, who said there was not sufficient knowledge of old workings across which one of the mine's three seams was known to extend.

Blinkpan, the youngest mine of Federale Mynbou, will be one of the largest collieries in South Africa. Its output will be 3,000,000 tons a year, and it will supply coal to the new Komati power station, which is likely to be the largest in the Southern Hemisphere. The first shaft has been completed and the mine will be fully mechanized. American and British firms have tendered for the supply of underground equipment.

Coal exported from the Union and Lourenço Marques during May this year amounted to 89,883 tons, and 11,704 tons was supplied for ships' bunkers. During May, 1959, exports were 22,208 tons and 10,633 tons were supplied for ships' bunkers.

The judicial commission appointed to inquire into safety in mines, in a statement in Johannesburg, said that comparing the accident rates of South African mines with those abroad, and considering the standard of mine management in the country, it was satisfied despite the Coalbrook accident, that there was no cause for alarm. The commission is studying the record of the evidence given at the Coalbrook inquiry.

Preliminary figures of exports of minerals from the Union for the period January/May, 1960, include the following:—Chrome ore, £1,300,102 (£1,103,599); lead ore concentrates £2,731,418 (£2,605,205); manganese ore £2,182,117 (£1,372,094); copper bar and blister £4,469,503 (£3,306,383); asbestos £5,198,022 (£3,839,492); coal £874,134 (£406,478).

Exports of manganese, although increasing in volume from 382,713 short tons in 1958 to 451,951 short tons in 1959, fell in value from £3,700,000 to £2,900,000.

NEW COMPANY, the Kelly Equipment Company, Limited, Ilkeston (Derbyshire), has been formed by Mr. Michael F. Kelly, former industrial sales manager of H. Leverton & Company, Limited, agricultural engineers, and tractor distributors, of Spalding (Lincs). The new company is to undertake dealerships for contractors' plant in the north and east Midlands. Other directors of Kelly Equipment are Mr. P. J. Broderick and Mr. J. Ryan, of Broderick & Ryan, Limited, civil engineering contractors.

USSR Industrial Plan "Overfulfilled"

ACCORDING to the half-yearly report of the Soviet Central Statistical Office, Russia's aggregate plan for industry has been "overfulfilled" by 4 per cent., the increase over the first half of 1959 being more than 10 per cent. Increases in principal industrial sectors include a 10 per cent. rise in metal production, 9 per cent. in fuel and energy products, 17 per cent. in machinery and metal working, and 11 per cent. in chemicals and rubber.

The shift away from coal towards other forms of fuel continues, and various metals and machinery items show up well. Chemicals, however, are far behind the seven-year plan growth rate, and railway rolling stock production has fallen sharply. While emphasizing impressive achievements recorded in many industries, the report lists failure to fulfil the output plan in the fields of gas generators for turbines, oil equipment, and excavators.

Steel production in the first half of 1960 rose to 32,000,000 tons against the 1959 figure of 29,300,000 tons, and output in other sectors (with corresponding 1959 figures in parentheses) was as follows:—Pig-iron 22,900.000 (21,000,000) tons, rolling mill products 25,200,000 (23,100,000) tons, iron ore 51,700,000 (46,300,000) tons, coal and lignite 257,000.000 (252,000,000) tons, machine tools 75,100 (73,100) units, oil equipment 46,000 (39,300) tons, and tractors 119,000 (106,000).

Costs were reduced by more than planned, says the report, with the result that in industry as a whole profits rose by 17 per cent. over the corresponding period of 1959. Labour productivity in industry is said to have risen by 6.4 per cent. despite a cut in working hours. The volume of State-planned investments rose by 13 per cent. over the corresponding period of 1959, yet this represented only 93 per cent. of the plan. For particular industries investments rose as follows:—Chemicals by 41 per cent., metals by 18 per cent., machinery by 29 per cent., and oil and gas by 8 per cent.

BROKEN HILL PROFITS CLIMB

RECORD group net profit was made by Broken Hill Proprietary Company, Limited, the Australian coal owners and iron and steel producers, in the year ended May 31, 1960. The net profit of £A13,716,000 was £3,500,000 more than in 1959 and was struck after providing more than £11,500,000 for depreciation, over £12,000,000 for tax, and more than £7,000,000 for plant replacement.

With the £7,000,000 addition, the provision for increased cost plant replacement is now £28,175,000. The appropriation for mining and development is raised from £1,200,000 to £3,750,000 and the dividend is increased from 8¼ per cent. to 8¾ per cent. on increased capital.

ADDITIONAL 55,000 sq. ft. of factory space has been acquired in West Drayton (Middx) by the Drayton Regulator & Instrument Company, Limited. It is to take over the Bridge Works of S. C. Johnson & Son, Limited, at the end of the year. In addition to increasing capacity for the company's standard products, part of the increased facilities will be devoted to the manufacture of sterilizing and other medical equipment.

Record Investments in ECSC Steel and Coal

IN the first four months of this year, says the High Authority of the European Coal and Steel Community, investments of a greater total value than for the whole of last year have been registered with the ECSC executive. This highest-ever record totals $733,000,000 for coal and ferrous metals investments (excluding iron ore), compared with $662,000,000 for the whole of last year. The figure is split into $106,000,000 for coal and $627,000,000 for iron and steel.

Of the coal investments registered over the four-month period, some 70 per cent. were for colliery plants and 20 per cent. for coking plants. Of the ferrous metal investments, 19.8 per cent. were for pig-iron units, 11.1 per cent. for raw steel units, 54.6 per cent. for rolling plant and 14.5 per cent. for power and miscellaneous plant.

Continuing favourable conditions in the steel market in Europe is seen in the estimates for the third quarter of this year of the High Authority of the ECSC. Raw steel production is expected to reach 18,100,000 metric tons, against 17,830,000 tons in the second quarter and 18,200,000 tons in the first quarter of the year. Raw steel consumption is set at about 15,200,000 tons, exports at 3,300,000 tons, and imports at 400,000 tons.

Pig-iron output in the third quarter is estimated to be around 13,800,000 tons, and the steelworks' consumption of pig-iron is expected to be about 710 kg. per ton, against only 700 kg. in the first 1960 quarter. Scrap consumption per ton of steel is estimated as only 395 kg., compared with 405 kg. in the first quarter of 1960 and 400 kg. a year ago. An estimated 7,900,000 tons of scrap will be needed, about 350,000 tons of which will have to be imported. Iron ore production in ECSC in the period is put at 6,700,000 tons and imported iron ore needs at 4,400,000 tons.

Raw steel production in Federal Germany last month totalled 2,956,471 tons, against 2,631,302 tons in June, daily output rising from 101,204 to 103,736 tons. Pig-iron production stood for July at 2,245,364 (2,057,934) tons, or an output per day of 72,431 (68,598) tons.

Employers Dissatisfied with Standard of Recruits

SUPPORT for the raising of the school-leaving age to 16 because of "the widespread dissatisfaction throughout industry at the standards of education of large numbers of boys and girls entering industry at the present time, particularly in elementary English and mathematics," is expressed by the British Employers' Confederation in a document issued last week.

The confederation considers that the advantage to industry of better educated recruits which would result from an additional year of full-time education would outweigh any disadvantages. The document consists of comments on the Crowther Report on the development of education for young people aged 15 to 18, and has been sent to the Ministry of Education.

DRAWINGS AND PAINTINGS by miner artists are being used by Matthias Spencer & Sons, Limited, manufacturers of coal-cutting and mechanical-handling equipment, of Sheffield, in its announcements.

Melting Shop Control

AN IMPROVED METHOD OF SAMPLING LIQUID METALS

By B. W. BERRY and C. CLEGG

(Round Oak Steel Works, Limited)

The constantly increasing demand for higher rates of steelmaking emphasizes the need for rapid and accurate analysis of samples taken from the molten bath. This demand is particularly so in the case of electric steelmaking if full advantage is to be taken of the high production rates possible and tonnage steelmaking is to be an economic proposition in large electric-arc furnaces.

USING the conventional drilled bath sample method, the problem of rapid analytical determinations when making high-carbon heats is readily appreciated. The delay caused by the necessity to slow-cool or anneal a high-carbon bath sample before drilling and analyzing can result in the failure to "catch the carbon" in open-hearth practice. Recarburization in the ladle is not always a satisfactory answer in high-quality steelmaking and can result in heats finishing outside the carbon specification. In electric-furnace practice, particularly the double-slag process, attaining the carbon specification is less of a problem, but any delay in obtaining analytical results reduces the production rate and increases the already expensive power costs.

This need for rapid bath analyses has been appreciated for some years and a number of new techniques have been developed to replace traditional chemical methods of analysis with methods based on some physical property of the steel. These have been the absorptiometric, electromagnetic, and spectromagnetic methods of analysis, the latest development being the direct-reading vacuum spectrograph.

Suction Sampling Technique

One simple sample-taking technique designed to overcome the problem of slow-cooling and drilling is that of sucking molten steel up a thin glass tube by means of a simple hand bellows or syringe. The result is a thin wire of metal which can be clipped into small pieces and analyzed by the normal chemical or combustion methods. This eliminates much delay when making high-carbon and alloy steel heats. Unfortunately, this technique is not always a complete success. The diameter of the wire must be small to be rapidly dissolved or burnt off, while, on the other hand, the smaller the tube bore, the more difficult it is to obtain a successful sample. Again, with small bore tubes, there is the problem of obtaining a sufficiently powerful suction.

At Round Oak, this problem has been successfully overcome by taking the next logical step and using an evacuated, sealed glass tube for sampling. At present, a tube of borosilicate glass of about 3 mm. bore, 5 mm. outside diameter, 6 to 7 in. long is used. The sampling tube is made by sealing one end and blowing out to form a small bulb. The air is then evacuated from the tube and the other end sealed so that it finally resembles a short thermometer tube as shown in Fig. 1. The usual bath sampling procedure of taking a spoonful of metal, skimming off the slag, and killing with aluminium wire is followed. The bulb end of the sampling tube is then inserted just below the metal in the spoon, the bulb immediately melts and liquid metal surges up the tube. The sample is then rapidly quenched in water, the glass shaken off, and the wire sent to the laboratory. The operation of inserting the tube into the metal and quenching the wire is so fast that it is almost one continuous movement. The result is a wire 6 to 7 in. long, weighing about 10 g., as shown in Fig. 1.

The technique was originally developed for rapid carbon checks on electric quality high-carbon ball bearing steel heats, which were a great problem when using the former drilled sample method. The method was later used in the open-hearth shop for obtaining a rapid approximate bath carbon shortly before clear melt. This check determines whether the carbon will melt out sufficiently high to make the carbon specification required or decides whether the heat should be diverted to a lower carbon specification. Round Oak being a cold-metal shop, it is not possible to recarburize the bath with additional mixer metal as in a hot-metal shop. Later, the method was used for a rapid carbon check immediately before "blocking" and tapping so that any necessary carbon adjustment could be made in the ladle. As a result, there has been a closer carbon control and greater ease of meeting high-carbon specifications.

Hundreds of such wire samples have now been taken and many of the early ones checked against drillings from chill samples taken at the same time.

In these latter instances the result of the wire carbon was available while the chill sample was still cooling. On all occasions, the method has been highly successful and accurate and provides samples suitable for rapid combustion carbon (or sulphur) determinations. The chemist knows the approximate length of wire required for the determination. This length is broken off, weighed, and the carbon (or sulphur) determined by the standard method. Any conversion calculation is eliminated by the use of a graph from which the actual carbon content of the steel is obtained from the weight of the sample and the increase in weight of the Midvale bulb (Fig. 2).

These 3-mm. dia. wire samples are unsuitable for wet chemical analysis, so the same technique was tried using 1-mm. bore tube with success. This provided a thin wire which readily dissolved in the acid concentrations normally employed. However, since the Quantovac at Round Oak was beginning to replace the traditional chemical methods, this particular technique has not been continued as a routine.

At a more recent date, the method has been adapted for taking samples for hydrogen determination. Formerly, the conventional split notched-pencil iron mould* was used, but the surface quality of the sample and frequently the delay in abstracting the sample from a worn mould, quenching, and transferring to the refrigerant led to unreliable hydrogen results.

Later a copper mould of the same design was used to obtain a better sample. By using a borosilicate glass tube, as shown in Fig. 3, excellent samples have been consistently obtained which can be rapidly quenched and transferred to the refrigerant. The size of the tube employed in this instance is 9 mm. bore, 11 mm. outside diameter, 7 in. long. The tube is of the shape shown in Fig. 3, so that the sample can later be easily broken to give two or more short samples suitable for the hydrogen determination. The sample for hydrogen determination is taken in the same way as the wire sample, but it has been found necessary to wait a few seconds after killing the metal in the spoon before inserting the tube and then holding the tube in the metal a few seconds longer than in the former case if the method is to be successful.

The superior surface and speed of taking these latter samples has given consistently higher (and, presumably, more accurate) hydrogen results than when using the chilled notched-

* J.I.S.I., 1943, Vol. CXLVIII, No. 2, p. 408, Hatfield and Newell.

FIG. 1.—MOULD AND SAMPLE FOR CARBON DETERMINATION (HALF ACTUAL SIZE).

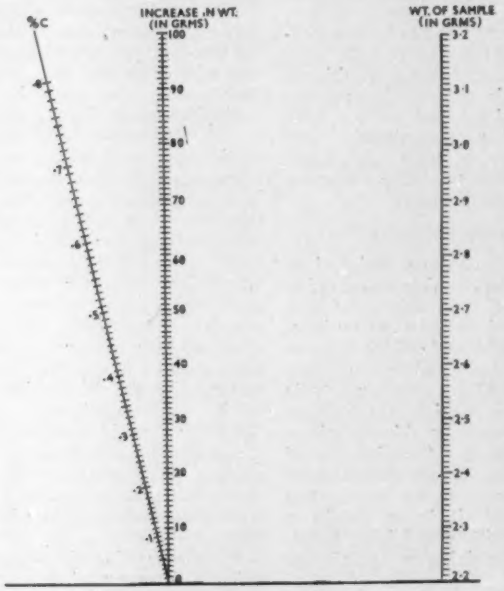


FIG. 2.—GRAPH FOR CONVERSION CALCULATION.

FIG. 3.—MOULD AND SAMPLE FOR HYDROGEN DETERMINATION (HALF ACTUAL SIZE).

pencil sample from the copper mould method. Some typical results are given below.

Cast	Copper Mould ($ml.H_2/100\,g.$)	Glass Mould ($ml.H_2/100\,g.$)
G.1976	6.6	8.0
H.1339	3.0	3.5
H.1340	7.0	9.6
H.1344	4.3	6.5
H.1347	13.0	17.2

An important additional advantage is that the metallurgist no longer has to carry a heavy, clumsy mould to the sampling position, but can carry a number of such tubes in his pocket.

The method may also be adapted to obtain spectrograph samples, eliminating the necessity for preparation and the delay which this incurs.

It is now a routine procedure in the Round Oak open-hearth shop to take pre-melt wire samples to indicate the carbon content at melt-out and later to check the carbon immediately before tapping on high and medium-carbon heats. These sampling tubes are commercially available at a cost of about 9s. 6d. per dozen. Against this cost must be considered the advantages gained such as less delay in the return of bath carbon results and the closer control this ensures of the carbon drop during steelmaking, less likelihood of heats outside the carbon specification, increased production rate, and no drilling costs, which is especially important in the case of high-carbon heats. In the case of glass tube samples for hydrogen determination, which is now accepted procedure at Round Oak, there is the increased accuracy of the results obtained by the new technique.

Acknowledgments

The authors wish to thank the directors of Round Oak Steel Works, Limited, for permission to publish this paper.

MODERNIZED HAND-FIRED BOILERS

THERE must soon be an end to the use of hand-fired boilers, which should be replaced by mechanical stokers which are cheaper and more efficient, states an illustrated booklet on modernizing hand-fired boilers produced by the National Coal Board.

The booklet explains that the temporary exemption certificates issued under the Clean Air Act to users of hand-fired boilers will not be granted after July, 1963, and suggests that now is the time to convert to mechanical stoking. Thermal efficiency can be increased by as much as 15 per cent.—an improvement which will cut coal consumption by up to 30 per cent. Mechanical stokers cut labour costs and can also use cheaper grades of coal.

"Coal burnt the modern way is clean, efficient, and economical," states the booklet, and "the cost of fitting mechanical stokers can generally be recovered from fuel savings in two years or less." One of the case histories given in the booklet shows that a firm saved more than £4,000 a year on reduced coal consumption and labour costs by fitting mechanical stokers to its boilers. The choice of stokers is discussed and a description given of the types available.

Nickel in the Modern Jet Liner

REFERENCE to the wide use of nickel in the modern jet liner is made by Mr. Henry S. Wingate, chairman of the International Nickel Company of Canada, Limited, in a letter to shareholders accompanying the interim report for the six months ended June 30, 1960. Most of the special alloys for jet engines today contain nickel, with the nickel content of the alloys ranging up to 75 per cent., he says.

The engines of a typical jet liner contain about 2,500 lb. of nickel, or 1¼ tons, plus about 200 lb. in the jet liner airframe and accessories.

Discussing the part the company has played in bringing the jet age into being, Mr. Wingate says: "International Nickel has long been active in exploiting the unique properties of nickel in the field of high-strength, heat-resistant alloys. The development of appropriate nickel alloys of this type made the application of jet engines in aircraft practical. In fact, a nickel-chromium alloy created in our research laboratories and produced in our rolling mills was used in the early jet aircraft engines designed by the English inventor, Sir Frank Whittle, and brought into production in 1940. Once the original obstacles were overcome, intensified and expanded research programmes undertaken by the company, as well as many others, developed increasingly stronger alloys for use in jet propulsion."

Declaring that nickel will continue to play a vital part in the high-speed vehicles of the future, Mr. Wingate says that the skin of the first experimental aircraft designed to carry man to the fringe of outer space and back is fabricated from a 75 per cent. nickel alloy developed and produced by International Nickel.

British Association's Annual Meeting

FOR a third time the British Association for the Advancement of Science is to visit Cardiff for its annual meeting, which will be held from August 31 to September 7. Sir George Thomson will deliver his presidential address at 8 p.m. on the opening day.

As usual, a wide range of papers will be presented and discussed during the sectional meetings, while an extensive programme of excursions ranges from visits to industrial and commercial undertakings both in Cardiff and further afield in many parts of South Wales and Monmouthshire. These are described in an excursions guide prepared by the local committee, which can be obtained on request.

Each member attending the meeting will be presented with a scientific survey of the Cardiff region, which has been prepared by an editorial committee under the chairmanship of Sir Frederick Rees.

STEEL OUTPUT in Hungary during the first six months of this year reached 945,000 tons, compared with 856,000 tons in the corresponding period last year. Rolled steel output was 592,000 tons—19,000 tons above the first six months of 1959 and 4 per cent. above the planned figure.

New Literature

NEW catalogues, booklets, and other publications which have recently been received include those mentioned below. Readers wishing to obtain a copy of any of the publications referred to should apply direct to the address given, at the same time mentioning IRON AND COAL.

MASSEY-FERGUSON (UNITED KINGDOM), LIMITED, Coventry—Mobile Power, a four-page publication in newspaper format, is brightly written and presented.

EDGAR ALLEN & COMPANY, LIMITED, Imperial Steel Works, Sheffield 9—Articles on "The Heat Treatment of Steel," "The Metal-arc Welding of Stainless Steels," and "Edgar Allen Steel Castings" are included in the August number of Edgar Allen News.

IMPERIAL CHEMICAL INDUSTRIES, LIMITED, Imperial Chemical House, Millbank, London, S.W.1—Recent address by Mr. S. P. Chambers, ICI chairman, to the English Speaking Union on "Some Anglo-American Trade Problems" is summarized in the August issue of the ICI Magazine.

INSTITUTION OF WORKS MANAGERS, 196, Shaftesbury Avenue, London, W.C.2—The design and erection of new factories, or their extension, is the subject of a comprehensive article by Mr. R. P. Jenner, managing executive of International Project Consultations, Limited, in the August issue of Works Management.

RICHARD THOMAS & BALDWINS, LIMITED, 82, Brook Street, London, W.1—August edition of Ingot News, the monthly eight-page production in newspaper format, maintains the excellent standard achieved over the years. The news stories and features are brightly presented and are supported by first-class photography.

ASSOCIATED ELECTRICAL INDUSTRIES, LIMITED, 33, Grosvenor Place, London, S.W.1—The AEI Engineering Review is a handsome magazine, the production of which is enhanced by the use of colour. The July issue, now to hand, contains many interesting articles covering various aspects of the electrical engineering field.

AUTOMATIC TELEPHONE & ELECTRIC COMPANY, LIMITED, Strowger House, Arundel Street, London, W.C.2—Publication No. 1473/CS is an attractive eight-page brochure dealing with the A.T.E. crystal chronometer, a compact unit incorporating an all-electronic pulse source with a time interval accuracy of the order of one second per month.

FIRTH-VICKERS STAINLESS STEELS, LIMITED, Staybrite Works, Weedon Street, Sheffield 9—The last issue of Enchiridion surveyed the company's first 25 years, 1934-59. The latest issue, dated July, 1960, looks to the future. An editorial states: "We shall continue our long-established policy of continuous expansion and reinvestment, and look forward to the time when extra capacity will be available and we shall be able to develop new markets and applications for our stainless steels." Various uses of "Staybrite" steels are outlined in articles in this colourful magazine.

OLDHAM & SON, LIMITED, Denton, Manchester—The Grid, the company's house magazine, makes a welcome reappearance with a summer number. It is the first issue for some time and is in a new and attractive form. An editorial says that in its new guise it will not only continue to act as the company's personal news bulletin, but will also include an increasing amount of news about company policy and developments. It aims "for the first time to provide a real link between Denton on the one hand and those thriving outposts which have grown up in recent years in countries overseas."

ALLEN WEST & COMPANY, LIMITED, Brighton 7—For 50 years the company has specialized in the manufacture of motor-starting and control equipment for all industrial applications. In addition to standard surface and flush-mounting designs, a wide range of equipment is specially constructed to the requirements of the machine-tool industry. Publication 1746/1 describes and illustrates a selection of such custom-built items.

Washing Process for Alabama Iron Ore

RECENTLY developed by the Bureau of Mines for treating certain ores from Alabama iron deposits, a simple washing process has proved commercially feasible and now is being used to provide a high-quality concentrate for blast furnaces, the US Department of the Interior reports.

Known locally as "Dudley red-iron ore," the deposits are near Dudley and Vance, Ala., in the Birmingham District. Their usefulness appeared uncertain because of clay-like materials mixed or "interbedded" with the iron. Working co-operatively with the United States Pipe & Foundry Company and the University of Alabama, both at Tuscaloosa, the Bureau of Mines developed and tested a washing and desliming cycle to upgrade the ore. At this point, the Southeastern Coal & Iron Company was convinced of the commercial possibilities and began its own research with the method. This culminated in construction of a 25-ton/hr. pilot plant, since enlarged. Other informal co-operators in the research included the Republic Steel Corporation and the Woodward Iron Company.

A technical report: Report of Investigations 5623, "Concentrating Argillaceous Surface Iron Ore of Tuscaloosa County, Ala., by Washing," describing the deposit, the development of the bureau process, and the commercial pilot plant has been issued by the bureau. It was written by I. L. Feld and W. E. Lamont, both of the bureau's Tuscaloosa Metallurgy Research Centre, and R. E. Perry, a research engineer for the United States Pipe & Foundry Company.

The report, which may be obtained from the Publications-Distribution Section, Bureau of Mines, 4800, Forbes Avenue, Pittsburgh 13, Pa, should be requested by number and title.

New Soviet Pit Locomotives

An "explosion-proof" inertia gyro-locomotive, the GR-G, manufactured by the Torets engineering works in the Ukraine, can make a two-mile underground run with one charge. The locomotive is driven by a compressed-air operated flywheel. It is claimed that unlike conventional machines of this kind, the new gyro-locomotive has a special device which enables continually variable speed regulation; this improves the manœuvrability and efficiency of this hauling engine where electric locomotives cannot be used for safety reasons.

MANAGERIAL STRUCTURE IN MINES

Presidential Address to South Staffs Colliery Managers

The urgency of improvements in the management structure of collieries formed the main theme of this presidential address to the South Staffordshire, Warwickshire, Worcestershire, and Shropshire Branch of the National Association of Colliery Managers on April 28. The author, who is production manager, Warwickshire Area, West Midlands Divisional Coal Board, suggests that more supervision is required in mines so that every man can be employed effectively to maintain output at the level required.

By T. L. CARR, B.Eng., M.I.Min.E.

FOR many years there has been criticism of mine management structure and much discussion of its serious shortcomings, but very little has been done to improve the pattern and to provide additional help. The Reid Report in 1945 commented upon the "failure to overcome the insularity of outlook in altering traditional systems and practices."

There were no specific words on colliery management structure, but a brief unfavourable comparison was made with continental mining engineers, who had "technical authority and were able to plan, develop, and apply machinery along the lines considered best."

The Fleck Committee in 1955 said "that the efficient management of the industry requires a higher supervisory ratio as well as a higher average quality" and it went on to say that "if pit management and organization are faulty, output must suffer." The chairman of the National Coal Board, in 1957, said that the colliery was the place where the next decade must produce the greatest improvements. A few years ago Dr. Revans and his research committee made a preliminary attempt, with the support of the National Association of Colliery Managers, to find out what management at a number of sample pits actually did. It was, said Sir Andrew Bryan in a discussion on Dr. Smillie's paper, "very revealing and suggested that a great deal more study was needed." I believe that no serious effort has been made to supplement the work of this committee.

And so, well into 1960, the problems of colliery organization are still not being tackled vigorously. I would have thought that with the closure of uneconomic pits that the opportunity would have been quickly grasped to implement some of the recommendations already voiced and agreed.

With a falling manpower — particularly in the West Midlands Division—it is necessary to employ every man effectively, with the need to maintain output at the level required. To this end concentration of output with mechanization is vital if coal is to be produced at the level of cost required to keep it the strongest competitor in the fuel market; in this time is not on our side.

For the past 20 years coal at any price has been the call and this had undoubtedly affected thinking and action on management problems more profoundly than is realized. The main effort, quite rightly, has been spent on reconstruction and reorganization, in order to achieve and promote increased efficiency and better products. What is needed now is more attention to the other and complementary facet of the drive for efficiency—improved management at collieries, to bring about reductions in operating costs. It is interesting to note that the chairman of B.P. said that "it would be imprudent to expect a material increase in trading margins . . . though we are paying particular attention to economies in operation in all sides of the business . . ."

Of the three most noteworthy papers on colliery management structure published in the past few years, two by Browne and Smillie were presented to the association's annual conferences and the third, by Longden and Webster, was presented to the Midland Institute of Mining Engineers. Compared with other industries and the mining industry in western Europe, Dr. Smillie shows that "our management pyramid at colliery level is much too stumpy and broad at its base" and he goes on to show how other industries have attempted to "relieve the trouble by widening the management structure."

Low Managerial Ratio

The ratio of non-industrial to industrial workers in 1954 was 5 per cent. in the mining industry and this compares with 10 per cent. for the west European mining industry. Unfortunately, it is not possible to quote any figures from the Anglo-American productivity report on coal or from the technical report on the visit to Russia, but it is plainly evident from the texts that the ratio is in excess of ours. For British industry as a whole the ratio is 18 per cent. and in the US industry the ratio is 25 per cent. Lamentable as these differences are, the situation is worse when the managerial grades at collieries only are considered.

In the discussion on Dr. Smillie's paper, Sir Andrew Bryan said that in the main functions of

management, that is production, engineering, planning, personnel, and administration, there were areas not adequately covered in present structures. If each of these branches had a head reporting directly to the manager, then this arrangement would be in line with modern concepts of management. Then responsibilities would be precisely and clearly defined to cover the whole field, officials would not be burdened continually, and consequently would discharge to a high degree their responsibilities and there would be efficient communication in both lateral and vertical directions.

Thus, management from top to bottom is united in determination to achieve the standards of output, to reduce costs, and to experiment with and use any machine or technique which will assist them to improve on their standards. Such management structures do provide the means for efficient management and one can see proof of this in the organization of the Dutch State mines, American mines, and large metal mining companies. The metal mining industry particularly has been subject to intense competition, world slumps, over-production, while in the American coal-mining industry increased costs have seldom been passed to the customer due to the severe competition from oil and natural gas. There must be something which we can learn from these experiences and practices which have stood the test of time and of competition.

There can be no set of rules to determine how many of the five functions shall be covered for any particular mine. Before one can decide on any changes it is necessary to determine the task and problems of the particular management. There should be no changes for changes' sake.

The test of successful management is one of performance; there is no criterion, other than improving results to the satisfaction of others, by which this success can be measured. If it is difficult to justify appointments in terms of cost, it is equally difficult to justify not making the appointments. How many times has the cost of not making an appointment been set out on paper and the whole coolly and carefully analyzed? When top colliery management is overworked and does not or cannot delegate authority to lower levels, then costly inefficiency ensues. One of management's greatest worries is to come to a decision on incomplete evidence, and if lower formations are also overburdened and time for discussion inadequate, then the complete facts will never be assembled. It would not be surprising if top colliery management in the circumstances referred the problem to higher levels in order to share responsibility for the decisions.

Distribution of Manager's Time

A recent survey at five collieries taken over a two-week period (not really a fair sample) showed how the colliery managers' time was spent. The results, expressed as a percentage of total time, show that:—discussion with undermanager, engineers, and surface officials occupied between 24 and 38 per cent.; meeting NUM officials, grievances, conciliation, and consultation, 20 to 31 per cent.; cost control, o.m.s., e.m.s., wages materials, 5 to 8.6 per cent.; signing reports and general administration, 5 to 14 per cent.; and pit visits, 11 to 28 per cent.

Time spent on pit visits and discussion with mine officials in no case exceeded 47 per cent. These figures compare badly with other industries where, because of the close proximity of the shop floor and ease with which junior management can immediately contact their seniors and the immediate availability for the head to see for himself, there is a much higher and more effective figure. Union and labour matters occupy almost as much of the manager's time as he spends with the undermanager and many of these matters do not warrant the personal attention of the manager and could well be dealt with by a labour officer with limited delegated authority.

Total time spent on cost control is pitifully low, while the useful time is even less when one remembers the almost complete absence of interpretations of results and figures for the manager. The aid of a cost accountant to interpret and present information for all levels and to analyze costs for future action and modification in methods would therefore be most valuable.

Time for technical discussion with mine officials is inadequate and it is well to ponder in this context on many of the reports made by HM Inspectors, which point out shortcomings of supervision and management.

Colliery Labour Officers

The case for a colliery labour officer at those collieries where there is a labour shortage can be fully substantiated. The labour shortages are already acute in the Midlands' engineering centres and the already serious drain of manpower from the collieries may be still further increased, as working hours in these industries are reduced as automation increases. A reduction in manpower must not mean lower outputs and hence higher costs. It is imperative that management should ensure full utilization of each man's working hours. Increased operating efficiency of plant and equipment must be provided to eliminate time-wasting factors, the accident rate must be reduced and attendance must be improved. Investigations into individuals' attendance have shown that improvements can be made and this and other duties connected with welfare and health are all important functions which can be performed by a labour officer to the general improvement of relationships.

By taking routine labour matters away from the manager he is given more time to use his ingenuity and skill and more time to apply technological advances in order to use labour as efficiently as possible. New machines mean new systems of work which, in turn, involves the wages at which men will agree to operate the new machines. Not only the union officials, but also men, have to be convinced of the new projects and especially the men for whom a change in job is threatened. Manage-

ment must therefore spend a great deal of time in cultivating attitudes maintaining activity and interest and obtaining the co-operation of all, which is a necessary condition for a successful enterprise. These are the real labour relations on which a manager must spend time.

To the five branches of management mentioned earlier should be added a sixth—finance and costs—not to become the junior or an offshoot of administration but one almost as important as production.

A direct comparison of costing staff complements in mining and other industries is practically impossible. Because of the varying circumstances, so much of the basis of cost information is also essential to other operating facets of the business. Some 60 per cent. of an Area costing staff produces historical costs with little or no interpretation; the remaining 40 per cent. devote their time to standard costing—one clerk to each colliery. I believe that our costing strength is less than one-half of other large businesses where in addition, the calibre of the individual is higher.

It would not be wise to place too great an emphasis on this disparity. Our need for cost accounting may be not quite so great, as labour forms such a high proportion of our costs. Money on cost control in labour spheres should be spent on increased supervision of a higher calibre—and in this I would include a provision for small colliery method study teams—in order to effect proper deployment of labour, not only day by day, but also in the short and long term.

"Every Penny Saved . . ."

With the growing complexity of mining and the continued need to find large sums for capital expenditure, the ratio between wages costs and other costs is decreasing, largely due to increases in depreciation, materials, and general expenses. From 1947 to 1958, over the country as a whole, the ratio of wages costs to depreciation dropped from 1:18.9 to 1:11.2. In the same period, the wages costs: materials costs ratio dropped from 1:4.3 to 1:3.7 and general expenses from 1:17.5 to 1:9.9. Every penny should now be spent by calculated design to achieve a specific purpose and every expenditure challenged. As Sir Simon Marks, of Marks & Spencer, Limited, reported in his statement on price cuts: "Every penny saved is a pound"—referring to the total gained from a saving of a penny in each of the 237 shops. This approach to saving and economy must be driven home to all.

In mining more difficult seams, highly specialized machines and ancillary equipment are bought, tried, and, maybe, taken out of operation if unsatisfactory. Plant utilization, materials costs, and general expenses require constant scrutiny. Who would look after the colliery's interest better than an engineer/accountant who is based at the colliery?

The trend in other industries is towards a tighter control of costs by the employment of cost controllers or value analysis managers in the management team. The type of person looked for is one who has had a few years of responsible production management and engineering experience. Such controllers are responsible for examining the constituent elements of cost, suggesting improvements and initiating activities specifically designed to reduce costs. They work closely with their production colleagues on the preparation of forward financial estimates of operating expenses and on proposals involving capital expenditure. It is their function to develop a "cost consciousness" in all formations.

Financial Control at Collieries

If there is to be proper devolution of responsibility for efficient production, then there must also be a devolution of financial responsibility. It is the engineers, undermanagers, overmen who spend the money—the manager can only control it. Each person must therefore know sufficient of the overall production plan on to which is superimposed the financial plan. There then must be the necessary machinery to show each person whether his part of the plan is being realized and, if not, why not and where not, and what the alternatives are, while there is time to do something about it. The information concerning operating costs should be simple and contain the minimum for control. Too much detail can result in mental indigestion and dissipation of effort over many factors, both large and small, in addition to which the cost of collecting and collating the information is too great. The basic information should be simply prepared to standards as in the system of "production control" now being established, and reliance for cost reduction should be placed on *ad hoc* and special investigation for special needs. For such special investigation a subject would be selected for study over a period of, say, three to six months, during which time the cost information on this subject would be expanded for this period only. At the end of a period another subject would be chosen. The attack on cost reduction is made specific and concentrated, the attention of management is focused on a particular item and their interest is stimulated at suitable intervals; all psychologically good for morale.

British industry has adopted modern methods of cost accounting and has accepted the need to have such "specialists" in the team; colliery management today must call for and adopt such techniques to strengthen their management team.

While I have suggested that additions to the management team at collieries are necessary, I am conscious of the difficulty of providing persons of suitable qualifications and calibre in sufficient numbers. Not unnaturally one turns to the DPT scheme to provide a partial solution. The provision of a greater number of management posts would provide better training in the early stages of a career in posts where juniors would be able to identify themselves more closely with management than is often the case now when they fill under-officials' positions. The result would probably be

to arrest the present exodus of DPT's from the industry, which is causing some concern.

An address on mine management would not be complete without some reference to the lower formations from undermanager to deputy. Scott and Noble in their paper "Concentration in Time and Space" put production in its proper perspective. The o.m.s. in others underground and surface, they said, are those elements which can be improved by short-term schemes and reconstructions and once completed the improvement in o.m.s. must come from the face. This is not easy due to variety in geological conditions and product requirements, for which no one method of mechanization can be applied.

The paper set out the savings which could be made in terms of manpower for face advance of over 10 ft. and as such the paper is worth re-reading for the fundamental principles stated. It is perhaps unfortunate that no reference was made to supervision of such faces, but quite clearly adequate supervision cannot be given by deputies who are able to spend not more than 40 per cent. of their time on the face supervising operations. There is also the associated problem of varying supervision over the three shifts. As a general rule it is true to say that the main weight of supervision falls on the day shift, leaving the "back shifts" relatively understaffed, even when there is coal turning on nights or afternoons. If we wish to improve the colliery management structure, we must not neglect means of increasing supervision over the whole 24 hours.

It is an important function of managers to ensure that their subordinates be controlled and checked, encouraged and trained and that their work be co-ordinated for the efficient performance of their duties. It is necessary for the manager to make time to examine the responsibilities and size of command, together with the authority held, from the undermanager to deputy.

The modern trend is to give assistance to the undermanager by the appointment of officials in charge of functions such as transport, development, materials, who thus form a "service" department to the main production units. There is room for the extension of this principle of supervision which has been proved so successful in the continental mines and in other industries.

Longden and Webster in their recent paper, "The Efficiency of Large and Small Collieries," propose strengthening colliery line management "by recognizing the coal faces as the basic unit of production and building from them a structure which limits the size and diversity of any one level of management, so that it can be effectively controlled by the next level of management. Thus, a large mine could be regarded as a collection of smaller mines each under the control of an undermanager who would be responsible to the underground manager for the operation of his section."

The underground manager would be responsible for the operational co-ordination of all underground working; functional officials and technical engineers would be responsible to him. The authors then show the results achieved at three large mines where the number of undermanagers was increased. The progressive increase in the o.m.s. is attributed largely to extra supervision, greater attention to detail in operation and in planning, and maintaining the stimulus of co-operation and competition. The authors conclude with the pert comment that "unless some reorganization is made on the lines suggested the modest results obtained at many of our mines will continue." There is nothing new in their suggestions to students of continental mine management formations.

Advantages of Improved Managerial Structure

Perhaps this is the point where we should look more closely at the results which ought to be obtained from improvements in the colliery management structure in relation to the colliery manager. The aim clearly should be to increase the effectiveness of the colliery manager and the improvements which I have suggested should bring the following advantages:—

(1) The manager should be able to spend a greater portion of his time on controlling costs and keeping in touch with all trends likely to affect the economic position of his colliery.

(2) The manager should be able to keep abreast of technical developments and keep himself informed on the wider issues affecting industry generally by setting aside time to "cultivate" his mind.

(3) The manager should be able to spend more time in discussion with his own and Area officials in detailed forward planning.

(4) The manager should be able to spend more time on general labour relations as distinct from individual labour problems. The emphasis should be upon prevention rather than cure, upon maintaining a healthy atmosphere at the colliery rather than settling disputes and complaints.

Shortly, therefore, the aim should be to give the colliery manager more time to see his work "in the round"; more time to see the wood, instead of just the nearest trees.

Vigorous discussion on management problems and management structure is both necessary and long overdue. If we really believe this we ought to take the initiative in promoting meetings so that the considered views of practising colliery managers can be presented in the proper place. Then we shall be able to carry out one of the objects of the association, stated explicity before its incorporation in 1889, "to effect improvements in administration."

In this address the urgency of improvements in colliery management structure has been outlined. But changes will be of limited value unless the need for change is recognized by colliery managers themselves. This association has an important role to play, both by furthering knowledge of management problems by objective discussion and by bringing home to all managers the need for improvements in organization.

MINE SAFETY EFFORTS MUST BE INTENSIFIED

Chief Inspector's Report For 1959

On average there is still more than one fatal accident every working day in Britain's coal mines. The industry must not regard this state of affairs as inevitable. The good work of all concerned in effecting the improvement which has been achieved is recognized, but a fresh drive and new ideas are needed to break through the present condition of stalemate.

REPORT of HM Chief Inspector of Mines (Mr. T. A. Rogers) for 1959 was published on Wednesday. An appendix gives statistics relating to safety and health, including figures for the number of persons killed and reportably or seriously injured, analyzed by classification of accidents and geographically.

The number of men killed in accidents in coal mines was 348 in 1959, compared with 327 in 1958, the 1959 figure including 47 men killed in the fire at Auchengeich Colliery. The report states that the experience of the last few years suggests that, disasters apart, there is still a trend towards lower accident rates, that it is now appreciably slower than in the 1940s and early 1950s. Mr. Rogers observes:

"The rate of improvement was bound to lessen, but the failure to make better progress in the last seven years cannot be accepted with equanimity. On average, there is still more than one fatal accident every working day and the industry must not regard this state of affairs as inevitable. Many of these accidents can and should be prevented, but we shall clearly not achieve the substantial improvement we all so much desire if present methods of accidents prevention and present attitudes of mind continue unchanged. The good work of all concerned in effecting the improvement achieved must be recognized, but a fresh drive and new ideas are needed to break through the present condition of stalemate."

A New Impetus

Mr. Rogers adds that he has been glad to learn of a renewed impetus being given to safety work in most divisions, and he expresses the hope that these efforts will be intensified. The Chief Inspector's report makes the following points:—

The number of men being killed and seriously injured by falls of roof on the coal face still gives cause for concern, but with the amount of research and development work being done on the subject of support an improvement can reasonably be expected during the next decade. Improvements in technique, in supervision, and in procedure at work would, if made widely enough, result in substantially fewer accidents. In several accidents caused by roof falls at roadheads, chocks had not been built; they, or some suitable alternative, should be included in all systems of support ahead of a ripping.

In 1959, 11 men were killed while getting stone from wastes where the roof was unsupported. This risk can be avoided, and officials should ensure that the system of work is such that there is no need for men to venture under unsupported roof.

A warning is given indicating the need to ensure that developments militating against good roof control (such as the use of larger driveheads or wider conveyors, machines moving so rapidly that they outstrip the setting of supports, and the making of deep pre-cuts) do not outweigh the benefits to be obtained from the use of improved types of support and greater prop densities.

Power-operated supports have their advantages, but, except in favourable conditions, they also have some disadvantages, in particular the need with some types to disturb all the support between the face and the waste edge during their advancement, and the difficulty of including packs in the system of support. Lack of space is also an important consideration in the operation of some systems of power-operated supports, creating a risk that persons may be injured by contact with the supports being advanced.

Use of Explosives

The numbers of persons killed, seriously injured, and slightly injured in accidents involving the use of explosives were at a disappointingly high level. The report emphasizes that the regulations impose on the shotfirer the responsibility for ensuring that all persons have either withdrawn from the danger zone or taken proper shelter. The shotfirer must discharge this responsibility by seeing for himself that everyone is in a safe zone or in proper shelter; a mere instruction is not sufficient.

In 1959, 16 persons were killed in coal mines by explosions of firedamp or coal dust; this compares with the excellent result in the previous year, when none was killed. A disturbing feature too commonly found in the investigation of explosions is that gas had not been detected near the site of the explosion before the accident took place. It is difficult to believe that gas in quantity sufficient on

explosion to give the effects so often found has always appeared suddenly, and the Chief Inspector is forced to the conclusion that the standard of inspection of some officials "is simply not good enough."

These may seem hard words, Mr. Rogers says, but only too often do inspectors find gas at places where previous routine inspections by officials had disclosed none.

The dangers of methane layering, particularly in large drifts, have been known for some years. It can also occur, however, in roadways within the area of moving ground behind the face even when they are considered to be well ventilated. It is clear that changes in barometric pressure play a large part in the extent of layering where it occurs, and that special examinations for firedamp layering are required in roadways within the area behind the face whenever barometric pressure falls.

The practice of firedamp drainage from strata boreholes continues to increase, particularly in the North-Eastern Division, where, at the end of the year, 15 collieries were draining a total of 2,750 cu. ft./min. The drainage of methane reduces the gas content of the wastes and of the air in the mine generally. Where high emissions of firedamp are expected, it is prudent to provide drainage facilities at the outset.

An interesting development in the technique of water infusion to inhibit the production of coal dust has taken place in the North-Western Division, where, at Parsonage Colliery, 1,000 gal. of water are simultaneously infused into each of four holes in a longwall face. The infusion is completed in one shift and provides sufficient water in the face for a whole week.

It is unfortunate that in some divisions there has been a steady decline in the practice of water infusion, the report states. This has occurred particularly where power loaders have been installed to operate two shifts a day. The third shift offers insufficient time to enable the whole face to be treated with water, but deep-hole infusion as practised at Parsonage Colliery ought to provide the answer.

Haulage and Transport Accidents

Altogether 75 men were killed and 482 seriously injured in underground haulage and transport accidents. This is disappointing. Year by year the Chief Inspector's reports have drawn attention to the more serious accidents and to the various shortcomings of both haulage installations and methods of operations. Yet again there have been accidents occurring because of poor layouts, lack of safety devices, bad maintenance, unsafe practices, and lack of proper rules and instructions. As in other years, "runaways" were the greatest single source of haulage accidents.

The number of persons killed or injured by electric shock or burns rose from 66 in 1958 to 96 in 1959. The increase was almost entirely attributable to accidents to electricians; the figure is the worst ever recorded. Most of the accidents to electricians could be avoided if they exercized a little more care and attention in carrying out their duties, and, in particular, saw that the supply of electricity was cut off a piece of apparatus before any work was done on it.

Reports by inspectors reveal that systematic examination and testing of the electrical apparatus and of mechanical equipment at many mines is not being properly implemented. Managements should review their schemes of examination and testing to ensure that any weaknesses may be found, Mr. Rogers states.

There was a sharp fall in the number of contraband offences—from 153 to 61—which suggests that the firm action taken by the National Coal Board, with the support of the unions, is having considerable success in stamping out illegal smoking.

Fewer Accidents in Quarries

There was a significant reduction in the number of persons killed (30) compared with 1958 (41) and in those seriously injured (94 in 1959, 116 in 1958) in accidents in quarries.

Of the various technical advances being made in the quarrying industry, probably the most rapid are in drilling and in the use of explosives. Modern machines can drill angled holes; many quarries have, as a consequence, adopted systems of off-vertical primary blasting, thereby enabling the quarry face to be sloped backwards, with consequential improvement in safety.

Mr. Rogers reports that at the end of 1959 the strength of the inspectorate was 156, a level higher than for some years, but one which is still substantially below the authorized strength of 186.

The report of HM Chief Inspectorate of Mines for 1959 is published for the Ministry of Power by the Stationery Office (4s.).

Mine-gas Analysis

GENERAL principles of gas chromatography are outlined and some applications to the analysis of mine gases are described by Mr. A. R. Baker and Mr. F. J. Hartwell in research report No. 189 of the Safety in Mines Research Establishment, Sheffield, published by the Ministry of Power (3s.).

Details are given of three instruments built at the SMRE for the estimation of many of the gases found in mine air. One is designed for the estimation of hydrocarbons other than methane, and contains three chromatographic columns operated in series. The second is for some of the more common gases, and the third is used to obtain reliable estimations of carbon monoxide. It is possible to detect 0.01 per cent. of most of the hydrocarbons and 0.001 per cent. of hydrogen and carbon monoxide. A complete analysis takes about one hour. The defects and errors in the present apparatus are discussed in the report and improvements are suggested.

THE QUALITY CONTROL DIVISION of Elliott Bros. (London), Limited, a member of the Elliott-Automation, Limited, group, is putting the new C.E.C. vapour phase process chromatograph on to the British market next month. The chromatograph, type 26-212, designed for a wide range of applications, is particularly suited for automatic closed loop control.

BISRA JUNIOR STEELMAKING CONFERENCE

Casting Pit Practice

Further Papers Read at Scarborough Meeting

The second session of the 14th Junior Steelmaking Conference, held at Scarborough on June 22 and 23, was devoted to the subject of "Casting Pit Practice." Three of the papers on hot-topping practices are given below.

EXOTHERMIC HOT TOPS

By J. R. WYNNE
(*Stewarts and Lloyds, Limited, Corby*)

PRIME aim of any steelmaker is to produce ingots which can be used in their entirety, but under normal operating conditions this is not always possible, particularly when killed steel is the product. Owing to volume changes which take place on solidification, pipe formation occurs and various hot-topping methods are adopted to minimize this pipe and increase the percentage of good useable product. A hot top provides a reservoir of molten metal which feeds the ingot below, compensating for the formation of pipe when the ingot solidifies.

At the outset it can be stated that exothermic materials are expensive, but their use can be justified when the increase in yield obtained is considered. When exothermic materials are used for hot tops, a chemical reaction takes place on contact with the molten steel, liberating large quantities of heat. The temperature rises quickly to above that of the steel, tending to increase the temperature of the feed metal. Normal methods of hot-topping are generally of insulating type, the nearest approach to exothermic methods being that of heating a fireclay dozzle to white heat before placing it on the ingot mould. Exothermic hot tops allow a flat feed with a consequent reduction in top crop necessary.

Fig. 1 shows a sulphur print of an ingot head teemed into a normal fireclay brick hot top, which required a 12½ per cent. top crop, while Fig. 2 shows a sulphur print of an ingot head teemed into an exothermic hot top, which required only a 5 per cent. top crop. This is an increase in yield of 7 per cent. These two ingots were taken from the same heat of a 0.20 per cent. C electric furnace steel.

I should now like to review briefly the development of the exothermic hot top which gave the head shown in Fig. 2 and which is now in standard use in our works. Fig. 3 shows the moulds which were used, type E being an open top small-end-up mould; type EA the same mould designed for use with an integral brick top. The mould size is approximately 3½ tons. When bricks were used, the head volume was 15 per cent., while the head volume necessary with exothermic hot top is 8 per cent. Fig. 4 shows the stages in the development, the black areas representing the exothermic materials and the cross-hatched and dotted areas representing different types of backing material.

The first trial was made with rammed exothermic

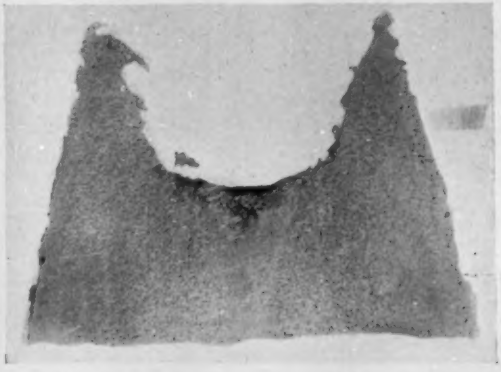


FIG. 1.—SULPHUR PRINT OF SECTIONED INGOT HEAD FROM FIRECLAY BRICK HOT TOP. TOP CROP 12½ PER CENT.

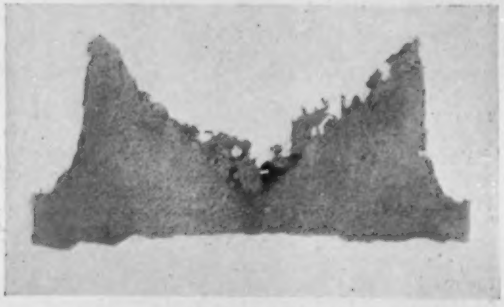


FIG. 2.—SULPHUR PRINT OF SECTIONED INGOT HEAD FROM AN EXOTHERMIC HOT TOP. TOP CROP 5 PER CENT.

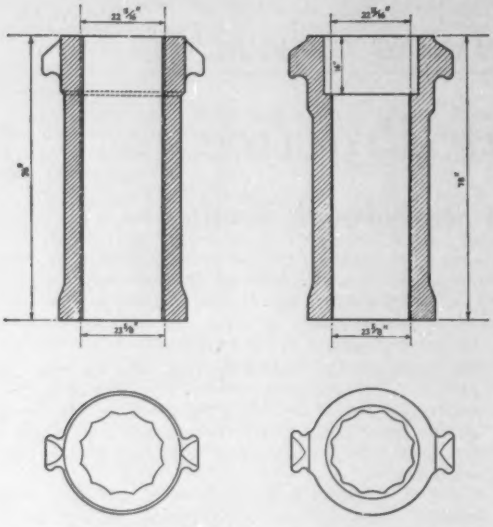


FIG. 3.—TYPES OF MOULD USED IN DEVELOPING AN EXOTHERMIC HOT TOP.

material, while the second trial was made with solid exothermic bricks. The increase in yield in both cases was considerable, but the economics of using solid "exothermics" was not a practicable proposition. Following on from these initial experiments, a compromise between insulating bricks and "exothermics" was used—in this case duplex slabs of refractory materials, faced with a comparatively thin layer of "exothermics." This method is considerably cheaper than using solid "exothermics."

Backings of refractories with different insulating properties were tried, while the amount and type of "exothermics" were also varied, but these changes did not give an increase in yield commensurate with the cost till the last two designs were developed. Here, recessed duplex slabs were used, these giving further insulation, because of the air gap between them and the mould wall. The first design of this type proved very promising and a number of minor modifications resulted in the final design which is used today. Fig. 5 shows a detailed drawing of this head, which consists of three preformed segments easily inserted into the EA mould. This design consistently gives ingots requiring only a 5 per cent. top crop.

In common with most hot-top practices, an anti-piping compound is used on top of the ingot to prevent loss of heat upwards to the atmosphere. In our case this is an exothermic powder mixed with powdered refractory to give an incandescent, insulating layer. In our works, exothermic hot tops are used with plain carbon steels in the range 0.10 to 0.75 per cent. carbon and have proved economic. In the field of more expensive alloy steels, they would prove to be most beneficial.

At the present time trials are being carried out to develop a suitable exothermic hot top for a 5-ton square small-end-up mould, but these are not yet finalized. However, Figs. 6 and 7 show a sectional head and sulphur print, respectively, taken from a 5-ton ingot on which duplex slabs were used. These indicate the progress to date.

THE USE OF C&D HOT TOPS

By W. A. JENKS
(*Lancashire Steel Manufacturing Company, Limited, Irlam*)

THE C&D hot top is used at Irlam for all killed steels, the bulk of which are in the 0.3 per cent. to 0.85 per cent. carbon range. These steels

EXOTHERMIC HOT TOPPING OF 3½ T DUODECAGONAL INGOTS.

TYPE MOULD	E	EA	EA	EA
PLAN SECTION				
ELEVATION SECTION				
INGOT SECTION				
ESTIMATED TOP CROP	8%+	5%+	10%+	10%+
TYPE MOULD	EA	EA	E	EA
PLAN SECTION				
ELEVATION SECTION				
INGOT SECTION				
ESTIMATED TOP CROP	9%+	9%+	5%+	c.5%

FIG. 4.—STAGES IN THE DEVELOPMENT OF AN EXOTHERMIC HOT TOP. THE BLACK AREAS REPRESENT EXOTHERMIC MATERIALS AND THE CROSS-HATCHED AND DOTTED AREAS REPRESENT OTHER BACKING MATERIALS.

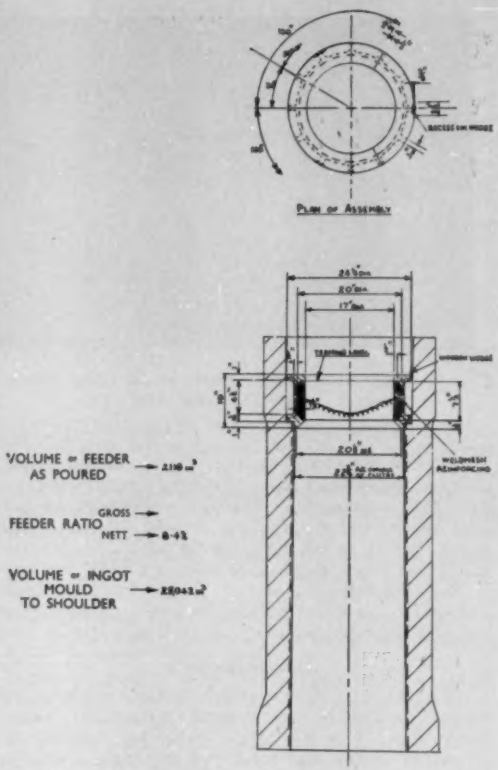


FIG. 5.—FINAL DESIGN FOR EXOTHERMIC HOT TOP OF 3½-TON MOULD.

are intended for rod and wire products which demand freedom from central unsoundness, it being necessary therefore to guarantee freedom from both pipe and centre segregation. The C&D top is used on a 21½-in. sq. closed bottom big-end-up mould which is considered here to be a vital necessity for quality killed steels. The ingots are teemed direct, on bogies, and the ingot weight including head is 73 cwt.

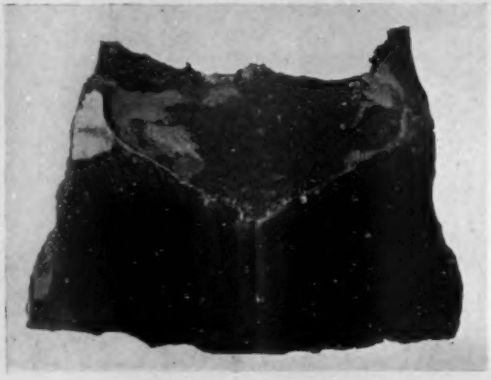
Description of the C & D Hot Top and its Operation

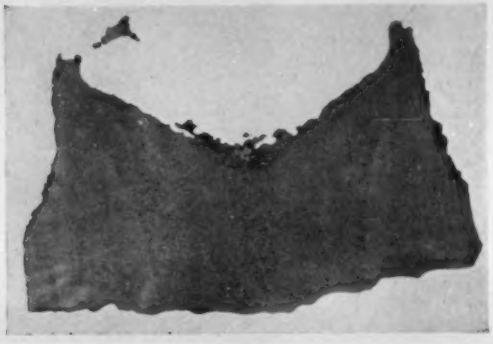
The C&D hot top as shown in Figs. 8 to 11 is a re-usable top comprising a cast-iron casing lined with refractory shapes which is inserted inside the ingot mould. The top is supported in the mould by means of wooden wedges which are removed when the ingot has been teemed. The size of these wedges can be adjusted to give an ingot length suitable for the length and section of rolled product being produced.

To protect the bottom of the casing from contact with molten steel, a refractory ring, which is held in position by means of spring clips, is fitted. Wiper strips are also fitted to take up the clearance between the side of the hot top and mould. The lining is protected with a thin layer of a proprietary slurry called "redimix," which is renewed between heats. This gives consistent refractory lives of 75 heats before relining.

The maintenance of the hot tops between heats is done on specially designed stands including gas rings for drying the "redimix" after coating. Centre-of-gravity trunnions facilitate manipulation.

After the steel has been teemed to the required level in the sinkhead and a feederhead compound added, the wooden wedges are knocked away, and the hot top is then free to float and move with the the contraction of the ingot body. The amount of contraction that occurs is between ¼ in. and 1 in. during the standing period of 1 hr. before the hot tops are stripped. The stripping presents no problems, stickers being almost unknown, and the presence of fins or refuse remaining is virtually negligible. The hot tops are then put on the stands, inspected, and serviced for the next heat. The number of tops required on each shift naturally





FIGS. 6 (*left*) AND 7.—SECTIONED HEAD AND SULPHUR PRINT, RESPECTIVELY, TAKEN FROM A 5-TON INGOT ON WHICH A "DUPLEX" SLAB EXOTHERMIC HOT TOP WAS USED.

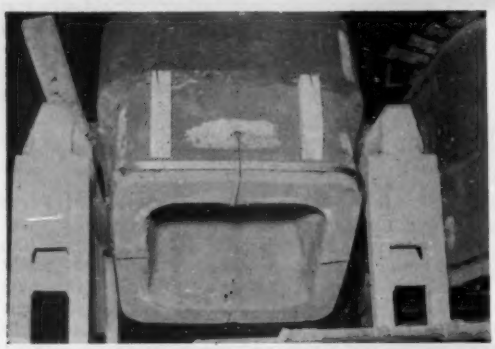


FIG. 8.—C&D HEAD, COMPLETE AND READY TO INSERT IN THE MOULD. THIS SHOWS THE RING, WIPER STRIP, AND WOOD BLOCKS CLIPPED IN POSITION.

FIG. 9.—C&D HEAD IN POSITION ON MOULDS READY FOR TEEMING.

varies, but up to 120 tops per shift can be dealt with.

Rolling and Metallurgical Quality

All ingots with hot tops are rolled through the cogging mill "head first" and the C&D head gives a particularly good bloom, with a distinct junction between head and body, and with little refuse or scrap to roll back. The standard cropping practice we have adopted is to shear the bloom just past the junction.

In considering the effect the hot top has on quality it is acknowledged that the prime function of a hot top is to confine the pipe within the sink head and to allow the segregates to concentrate at the base of the pipe cavity. Steelmaking practice can effect the distribution of segregates, but it is found at Irlam that by shearing just below the junction, the top of the leading billet rolled from an ingot is completely free from pipe and centre segregation, other than that to be expected from normal ingot heterogeneity.

The quality of the billets is continually checked by sulphur prints and etch tests, and sulphur prints of a sectioned head and ingot have confirmed each time that a maximum sinkhead volume of 14 per cent. as teemed is adequate to give 100 per cent. prime quality in the body of the ingot. A feature which has been found since using the C&D hot top is the complete absence of hanger cracks, which was quite a problem before the introduction of the use of a superimposed type head box.

Developments

An extended trial was carried out using insulating shapes instead of the normal refractory shapes inside the C&D hot top. A thicker coating of refractory slurry was used and the ingot shoulder increased and head cross section thereby reduced. A poured volume of 11½ per cent. was employed and sulphur printing and etching of sectioned heads and rolled product showed this was just sufficient to guarantee an ingot free from piping and serious segregation. A saving of 2 per cent. by weight in bloom yield was obtained over a period and this modification certainly seems inter-

FIG. 10.—AFTER TEEMING, SHOWING WOOD BLOCKS REMOVED TO ALLOW C&D HEAD TO "FLOAT."

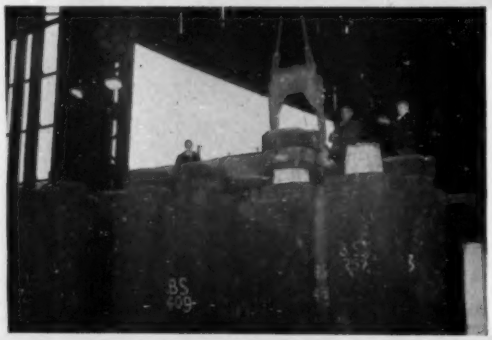


FIG. 11.—STRIPPING OF C&D HEADS. ONE HEAD HAS ALREADY BEEN REMOVED.

esting. The hot-topping costs per ton would, however, be higher owing to the reduction of brick lining life from 75 to 40 heats and increased usage of "redimix." Also, because a greater thickness of "redimex" has to be used, the drying time required is longer and hence more stands are necessary for the same tonnage throughput.

In view of the excellent results being obtained with the normal C&D heads, which have certainly stood the test of time both practically and from a quality point of view, it was decided not to put the insulated, low-volume, C&D head into routine use at the present time.

SOME NOTES ON VALLAK HOT-TOP PRACTICE AT CONSETT IRON COMPANY, LIMITED

By Dr. S. G. Cope and G. Lonie
(Consett Iron Company, Limited)

APPROXIMATELY 22,000 tons of steel are produced per week at Consett. About 15 per cent. of this total is killed, while the remainder is in balanced and rimming qualities. The steel is cast into moulds set on bogies which are transported to and from an adjacent stripper bay. Rimming and balanced steels, which constitute the greater proportion of the output, are cast into narrow-end-up moulds. From a handling point of view in a tonnage shop like Consett, it is desirable to cast the killed steel similarly. Handling requirements have assumed special importance at Consett because the weekly output has approximately trebled from 7,500 tons in 1939 to the present-day level, while the casting bay area has remained the same. In consequence, little space can be devoted to the making-up of hot tops.

In 1956, the entire killed steel output was made in wide-end-up moulds fitted with conventional fire-brick superimposed hot tops. In addition to the inconvenience of handling, the yields were low. At that time, a 10-ton killed ingot cogged to a 9-in. square bloom gave a total yield of only 76 per cent. In consequence, the idea of using an easily handled suspended top in our normal moulds was looked upon very favourably. This was the position existing in 1957 when Consett tried its first Vallak tiles. These were inserted into a 10-ton narrow-end-up square mould of the type used previously only for rimming and balanced steels. The tiles used at first were brittle and difficult to handle, but from this beginning developed the eight-

Fig. 13.—Vallak Hot-top Assembly in 10-ton Square Mould.

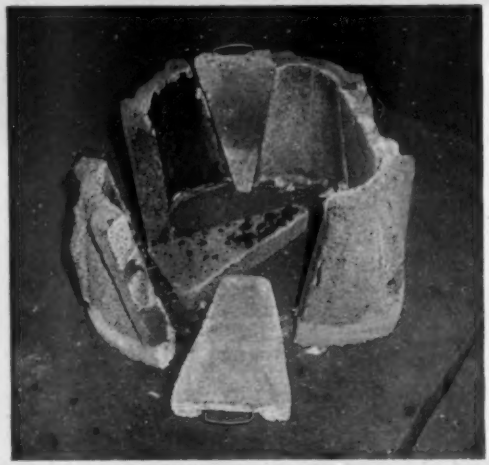


Fig. 12.—Set of Eight Tiles Forming Vallak Hot Top for 10-ton Square Mould.

Fig. 14.—Line of Vallak Hot-topped Moulds Ready for Teeming.

piece tile head in current use (Figs. 12, 13, and 14). The toughness of the tiles has been increased and today they will resist reasonably rough handling.

Developed in Sweden

Vallak insert tiles were developed in Sweden and their use has spread to Italy, Germany, Austria, Holland, and England. The tiles are of a semi-combustible, partly carbonaceous mixture with a dolomite facing. In manufacture the dried constituents are mixed with sodium silicate, the binder, moulded and dried. The particle size distribution of the backing material is such that the texture is very open. With a density of about 60 lb./cu. ft., the Vallak tiles are twice as good an insulator as normal firebricks and, in consequence, make a more efficient head. The efficiency is further increased by slow self-combustion. The dolomite facing has two purposes. It prevents carbon pick-up by the steel from the carbonaceous backing and provides a non-adherent surface so that the ingots will strip cleanly. Due to the porosity of the tile backing, the carbon dioxide evolved from the dolomite can easily escape without causing a boil in the hot top.

In the course of development it was found that a four-piece head, with one tile for each wall of the mould, would not accommodate the variations which exist in the dimensions of the larger moulds, up to 20 tons, used at Consett. The eight-piece head, already described, has wedge-shaped tiles which accommodate these variations, say, $\pm\frac{1}{2}$ in., fitting tightly against the mould walls at all times. A slate-dust silicate glue is used to stop metal penetration. Fitting of the tiles is done by hand by unskilled labour, no crane work being involved. Fig. 15 shows the actual setting of Vallak hot tops.

Today a large percentage of our killed steel output is cast into Vallak topped narrow-end-up moulds. This practice has given the following advantages over the conventional hot-top practice:—

(1) As the tiles are totally consumed, a much-reduced labour force is required to prepare and repair the hot tops. Two men only are employed per shift for making Vallak tops, setting up conventional hot-topped and uphill casts. The space for the preparation of hot tops has been considerably reduced.

(2) The use of narrow-end-up moulds has reduced the number of crane lifts by 60 per cent. As the ingots do not have to be extracted, it has been possible to reduce track times, thus increasing soaking efficiency and prolonging the life of moulds.

(3) There has been an increase in yield: 84 per cent. prime yield is being obtained currently with 9-in. by 9-in. cogged blooms from 10-ton square moulds. As well as using Vallak tops, an exothermic anti-piping compound and the practice of back-teeming are used to maintain these high yields.

(4) It has been possible to reduce the number of mould types in use. The same moulds are now used in the production of all types of steel.

(5) The use of narrow-end-up moulds has eliminated the occurrence of hanger cracks.

(6) The mould costs per ton of steel have been reduced because of:—(*a*) the reduction of track times reducing the actual time the ingot is in the mould, and (*b*) the fact that narrow-end-up moulds last longer than do wide-end-up ones.

(7) The practice involves no capital cost as, for instance, of frame castings for conventional superimposed hot tops or other devices used for different types of special hot tops.

FIG. 15.—ASSEMBLY OF VALLAK HOT TOP IN THE MOULD.

Greater Cost Justified

This combination of advantages has justified the greater cost of the Vallak hot tops as compared with the conventional brick hot tops used previously.

Although it has such strong advantages in handling, the narrow-end-up mould is not an ideal shape from the viewpoints of piping and segregation. During the period of introduction, several ingots were sectioned and sulphur printed. A slow burning exothermic anti-piping compound (Ferrux 101) which crusts over after combustion is used on the ingot tops. The ingots are back-teemed while the anti-piping compound is still in an easily penetrated powdery state. Back-teeming has been proved to be necessary to produce high yields of steel free from piping and central segregation, no adverse affects being noted on the steel produced. Under these conditions of casting, no secondary pipe has been detected in any of the sectioned ingots. This may be explained partly by the fact that, though the 10-ton ingot is classified as being narrow-end-up, it is almost parallel sided, the taper being only $\frac{1}{4}$ in. on a height of 7 ft. 6 in.

In some casts, such as special high-carbon steels,

(*Contd. on p. 412, foot of col. 2*)

REMOVAL of SULPHUR and PHOSPHORUS in *Acid Electric Steelmaking*

This is a translation of a paper by V. J. Ivanov, chief metallurgist of Luganski Locomotive Steelworks, from Metallurg, No. 3, 1960. It describes a practice for the removal of sulphur and phosphorus in an acid electric-arc furnace that was developed to avoid operating one furnace of the electric melting shop as a basic-lined furnace for the sake of producing occasional casts of low-sulphur and phosphorus steels.

IN basic electric-arc furnaces the melting of steel is considerably more expensive than in the acid electric, because the productivity of the basic furnace is 1.3 to 1.5 times lower than that of the acid furnace for steels of the same type. Correspondingly there is a higher expenditure of electrical energy and of electrodes for the production of 1 ton of basic electric steel; furthermore, the cost of materials for fettling of the lining and hearth of the furnace is much higher than the cost of quartz sand, which is used for fettling acid furnaces.

In spite of this, many works where high-manganese steels are produced, are forced to use basic furnaces in order to purify metal from sulphur and phosphorus.

Luganski Investigations

The Luganski Locomotive Steelworks (works in memory of the December Revolution) is required to produce alloy steels (*e.g.* 5XHB; 4XC; 20XH3A; X18H125C2; X20H14C2) with phosphorus and sulphur contents under 0.03 per cent. In spite of the fact that production of these alloy steels is only 7 to 10 per cent. yearly production of an 8-ton furnace, the works had to have one electric furnace with basic lining. Technicians in the works, V. P. Perov, V. V. Zihor, V. A. Valdemirov, and the author of this paper, carried out investigations on partial removal of sulphur and phosphorus in an acid furnace with a view to discontinuing the making of alloy steels in the basic furnace.

Initially, after melting of the charge, and after partial skimming of slag in order to remove phosphorus, they aimed to produce an iron-lime slag by adding 2.5 kg. of dry iron ore and 5 to 6 kg. of limestone per ton of steel. This slag was completely removed in 20 to 25 min. The content of phosphorus decreased by 0.005 to 0.01 per cent. (Table 1). Later, in order to reduce the time of melting, and on the suggestion of scientist M. I. Topaller, the making and removal of an iron-lime slag was carried out up to the completion of melting. With this procedure the content of phosphorus decreased by 0.005 to 0.015 per cent. (Table 2).

TABLE 1.—*Lowering of Phosphorus Content in the Process of Melting.*

Content of P in the bath, per cent.	Content of P in final metal, per cent.
0.035	0.029
0.033	0.027
0.030	0.025
0.035	0.026

TABLE 2.—*Content of Phosphorus in the Bath and in the Metal by Use of the New Process.*

Content of P after melting, per cent.		Content of P in final metal, per cent.
Expected, using the old process.	Obtained, using the new process.	
0.040–0.035	0.025	0.026
0.040–0.035	0.026	0.025
0.040–0.035	0.024	0.025
0.040–0.035	0.023	0.024
0.040–0.035	0.026	0.029

Optimum percentage compositions of slags after melting are shown in Table 3.

For partial removal of sulphur after removal of the iron-lime slag, a new slag was produced by addition, under the electrodes, of freshly prepared lime (8 to 10 kg./m.ton of charge) and 2-2.5 kg./m.ton of chamotte material. During melting down the power output of the transformer was increased. After 15 to 20 min. the slag was completely removed and an oxidizing slag was introduced by adding mixture of limestone, sand, and chamotte in quantity equal to 2 per cent. of the metallic charge in the proportions 1.2 : 1 : 1 (*i.e.*, for 8-ton furnace 7.5 kg./m.ton; 6 kg./m.ton; 6 kg./m.ton). At the same time a ferro-manganese

TABLE 3.—*Composition of Slags After Melting.*

CaO.	SiO_2.	FeO.	MnO.	Fe_2O_3.	Cr_2O_3.	P_2O_5.
13.50	49.5	21.72	11.88	1.61	0.61	0.09
9.15	40.35	25.24	12.54	2.38	0.12	0.16
15.52	48.45	19.92	11.68	0.51	0.40	0.05

addition was made to bring the manganese content of the steel to 0.15 to 0.20 per cent.

Change of sulphur content in the bath is given in Table 4. It can be seen that the content of sulphur decreased by 0.007 to 0.015 per cent. The condition of the banks of the furnace hearth after refining by the above process was little different from that resulting from the normal process. For the normal process the fettling of the furnace takes 5 to 8 min. and the same time is required for the refining by the process described above.

Optimum percentage compositions of slags for desulphurization are shown in Table 5.

The introduction of the new process made it possible to produce alloy steels in acid electric furnaces. The steel thus obtained corresponds in composition to GOST (National Bureau of Standards) and is successfully used in the shops of our works.

TABLE 4.—*The Change of Sulphur Content in the Bath.*

Melt.	Content of S, per cent.		Grade of steel.	Total duration of melting inc. fettling of furnace.	
	After melting.	In final metal.		Hr.	Min.
5980	0.039	0.030	5XHB	4	05
69171	0.038	0.030	4XC	3	35
69218	0.038	0.025	20XH3A	4	13
59155	0.037	0.028	20XH3A	3	42
69251	0.029	0.019	X18H25C2	3	32
59193	0.030	0.015	X18H25C2	3	26
59335	0.041	0.030	20XH3A	3	45
59329	0.036	0.025	20XH3A	3	37
59374	0.037	0.030	5XHB	3	35

TABLE 5.—*Percentage Composition of Slags for Desulphurization.*

CaO.	SiO_2.	FeO.	MnO.	Fe_2O_3.	Cr_2O_3.	P_2O_5.	S.
14.6	55.8	6.94	11.06	0.61	1.47	0.05	0.11
8.26	55.2	6.97	13.41	1.37	0.5	0.06	0.10

BRITISH IRON AND STEEL INDUSTRY TRANSLATION SERVICE

FOLLOWING is a list of some new translations available from the Iron and Steel Institute under its translation service scheme. Translations are all classified by numbers, and these should be quoted on application, which should be addressed to the institute at 4, Grosvenor Gardens, London, S.W.1.

1531: "Polarized Light in Metallography. Application to the Determination of Austenite Grain Size." F. MUNOZ DEL CORRAL. Inst. Hierro Acero (Madrid), 1954, Oct.-Dec., pp. 464-467. £2 5s.

1548: "The Determination of Rated Capacity and Production Control in the Grinding and Deseaming of Billets on the Basis of Statistical Analysis of Performance." J. WOLF. Stahl u. Eisen, 1959, July 23, pp. 1075-1079. £3.

1579: "The Progress of Solidification of Mild-steel Ingots in Ingot Moulds." P. PARMENTIER and R. SEVRIN. Rev. Univ. Mines, 1959, vol. 15, Nov., pp. 783-795. £5 10s.

1597: "Recent Developments in the Stürzelberger Iron Reduction Process." H. REINFELD. Radex Rund., 1951, Sept., pp. 178-187. £5 15s.

1624: "Research on Austenitic Cr-Mn-C-N Stainless Steels" (summary, giving 12 tables, 41 figures, and 60 references, with translated captions). CHI-MEI HSIAO. Acta Metallurgica Sinica, 1958 (2), pp. 138-180. £12.

1650: "The Forging Process on Hammers and Presses with Particular Reference to Rising (Die Filling)." J. STÖTER. Werkstattstechn., 1959, April, pp. 223-230. £4 15s.

1691: "Investigations on the Economic Operation of d.c. Reversing Rolling-mill Motors for Heavy Rolling Mills." M. GÜNDEL. Metallurgie u. Giesserei Technik, 1955, Feb., pp. 50-60. £8.

1700: "The Introduction of the Magnetic Amplifier for the High-speed Control of Rolling-mill Drives." J. WETZGER. Stahl u. Eisen, 1955, Apr. 21, pp. 478-485. £6 15s.

1704: "Measuring Principles of the Magnatest Q-method and its Testing Possibilities in the Steel Manufacturing Industry." F. MICHALSKI and E. KEMENESY. Materialprüfung, 1960 (2), pp. 56-64. £5.

1720: "Prestressed Screws in Steel Construction." O. STEINHARDT. VDI-Z., 1959, July 1, pp. 769-773. £4.

1742: "Considerations of Economy in the Choice of the Charge in Open-hearth Steel Process." G. SCHMIDT. Stahl u. Eisen, 1960, Mar. 3, pp. 282-285. £2 15s.

1753: "Pseudo-random Numbers for the 'Strela' Computer." I. M. SOBOL. Teoriya Veroyatnostei i ee Primeneniya, 1958 (2), pp. 205-211. £4.

1789: "The Influence of Phosphorus and Nitrogen on the Hardness of Low-carbon Rimming Steel after Different Pre-treatments." A. DREVERMANN. Stahl u. Eisen, 1960, 80, June 9, pp. 801-809. £5 15s.

1815: "On the Character of the Hysteresis of the Demagnetizing Factor." V. HAJKO and J. DANIEL-SZABO. Czechosl. Journ. Phys., 1958, 8, pp. 685-8. £2 5s.

Casting Pit Practice

(*Contd. from p. 410*)

where a very narrow range of carbon is specified, wide-end-up moulds are used to lessen analytical variation through the ingot. With these moulds, the inserted-tile type of hot top cannot be used since the stripper cranes at Consett require a minimum of 10 in. of steel proud of the mould top to allow ingot extraction. At present, conventional bricked hot tops are used on these moulds, but experiments are being carried out with a one-piece Vallak superimposed head in an attempt to gain the yield advantages associated with insulating hot tops.

Testing Conveyor Belts

DUNLOP'S NEW LABORATORIES

LIKE most aspects of modern industry, the production of belting has developed into a highly complex technique. In order to keep abreast of the demands of industry and to take full advantage of developments, a new organization has been set up by Dunlop's belting division at the company's factory at Speke, near Liverpool. It is based on a recently completed industrial laboratory. Not only does it enable the belting division to take full advantage of new materials and new processes, but it also reinforces production control and ensures that specifications are closely maintained during manufacture.

The laboratory is divided into two sections, testing and development, both responsible to the laboratory manager. A wide range of equipment is available in the laboratory and is employed by the development team and also used to reinforce the work of process control.

Regular tests are carried out on current production and the results, after evaluation, are passed to process control manager for the release of belting to the sales organization, or so that immediate corrective action on the production line can be taken wherever necessary.

Control Testing

Samples cut from every separate belt made are passed through for testing. This is carried out in a conditioned atmosphere and the most important testing units are as follow:—

Tensile Strength and Elongations.—This is largely carried out on an Amsler machine (Fig. 1), which can apply a maximum load of up to 30 tons to samples under test. It is used to obtain records of warp and weft tensile strength at break, on sections of finished belt, together with elongations at working load and at break.

A Hounsfield tensometer is also available for tensile measurements on narrower belt sections, *i.e.*, for testing according to National Coal Board specifications.

Impact Resistance. — This important property is tested on a special machine of Dunlop design and construction. A loaded pendulum is realeased under control to deliver an impact blow on the belt sample. The level of impact energy and the tension in the belt can be adjusted as required.

Adhesion Resistance.—Routine examination for adhesion is carried out by the dead load hanging weight method. For more precise measurements, a Hounsfield tensometer, which gives a graphical record, is employed.

Tear Resistance.—The resistance of belts to tearing is becoming increasingly significant. For both control and development, the belting division makes full use of the Hounsfield tensometer equipped with auxiliary devices, which enable accurate measurements of tear strength to be obtained.

Flame Resistance.—The fire-resistance test for assessing this property is carried out in a fume cupboard where a sample is placed over a spirit burner for 30 sec. and then removed. To meet the specification, any flame or glow must go out in less than 5 sec.

Non-static Properties.—This test is carried out by investigating the surface conductivity of a sample at a potential of 500 V., using a circular electrode system as designed by the NCB.

Other routine tests carried out include those to

FIG. 1.—TENSILE STRENGTH OF A SAMPLE FROM A NYLON BELT BEING MEASURED ON AN AMSLER MACHINE.

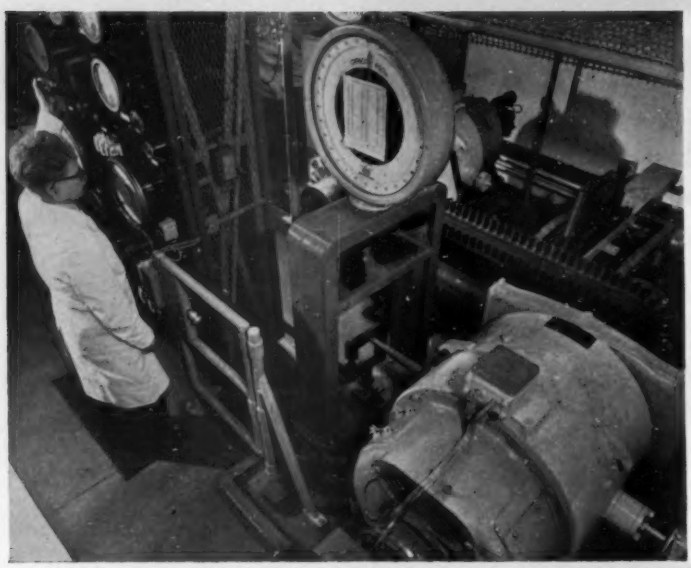


FIG. 2.—SETTING THE CONDITIONS FOR AN ENDURANCE TEST ON A FLUTED-EDGE BELT IN THE DYNAMOMETER LABORATORY.

determine flexibility and dimensional characteristics. A new electronic instrument for testing tensile strength and elongation is also being developed, based on designs by the Research Association of British Rubber Manufacturers.

It is particularly important that the information provided by control tests is properly utilized. Quality control charts are maintained on all important properties and any trends are therefore immediately observed. Belt test results are summarized on test report forms, of which one copy is passed immediately to the process control manager, who releases the belts accordingly.

The development side of the industrial laboratory naturally has access to all the equipment used for control testing. In addition, the laboratory possesses a range of specialized equipment enabling the production significance of any new idea to be evaluated. The principal plant items under this heading are as follow:—

Compounding Mill. — The modern 12-in. laboratory mixing mill installed is noteworthy. It is equipped with the latest safety device designed by the Research Association of British Rubber Manufacturers, which, in conjunction with Dunlop industrial disc brakes, affords maximum protection by arresting the rolls of the mill in $\frac{1}{16}$ of a revolution. This equipment is used in the development of new compounds of both rubber and PVC.

Calender. — A laboratory calender for the evaluation of the friction and topping characteristics of new compounds and fabrics is available and is also fitted with Dunlop industrial disc brakes.

Spreader.—The characteristics of new fabrics requiring a spreading treatment, and of new bonding agents, are assessed with the aid of a spreading machine. This is equipped for use in connection with both rubber and PVC investigations and is fitted with a gas-fired infra-red radiator for gelling PVC compounds.

Loom.—Development of new types of belting fabrics are just as important as the development of new rubber and PVC compounds. A specialist designer of textile fabrics is aided by a hand loom for the preparation of experimental weaves or the evaluation of new fibres in woven form.

Dynamometer.—One of the biggest plant items on the development side is the dynamometer laboratory. This contains a 25-h.p. dynamometer (Fig. 2) which enables power transmission and driving characteristics of transmission and conveyor

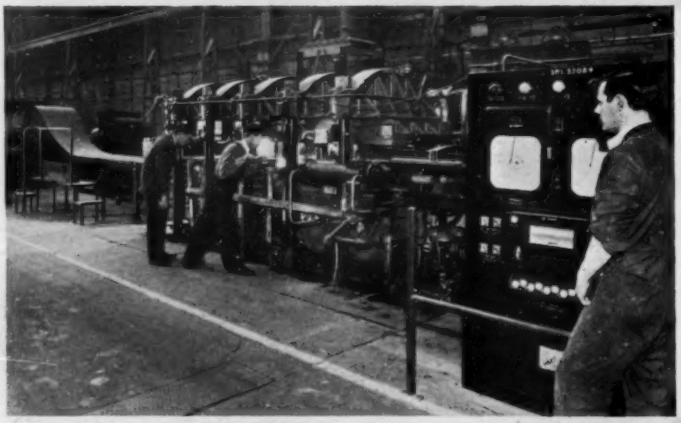


FIG. 3.—MANUFACTURING AN EXPERIMENTAL BELT ON AN AUTOMATICALLY CONTROLLED PILOT PLANT PRESS IN THE FACTORY UNDER CLOSE TECHNICAL SUPERVISION.

belting to be assessed. It is also used to measure coefficients of friction and for endurance tests to evaluate fatigue resistance. Consideration is at present being given to the construction of a much larger laboratory, accommodating an 800-h.p. machine.

These are the most important equipment items specially installed for the development staff, but there is also a wide range of auxiliary testing equipment, of the kind found in most large development laboratories.

In addition, the development side has at its disposal a 10-ft. production press, installed in the factory (Fig. 3), where it is used for the manufacturing assessment of new projects.

Although the industrial development laboratory of the Dunlop belting division is entirely self-contained, from compound and textile preparation up to the manufacture and evaluation of finished belts, it has the advantage of being able to draw upon the results of work carried out at the company's research centre in Birmingham. All the long-range studies carried out by the central research division, coupled with the shorter-term investigations of the development division, are available for the practical consideration of belting division. A joint committee meets regularly to discuss projects and to initiate new research called for by service requirements.

Worthwhile results emerging from this co-operative effort is naturally made available to all Dunlop belting factories throughout the world. This ensures that advantage is taken of every opportunity to improve the performance and economy of the entire range of transmission, conveyor, and other types of belting.

SWEDISH FRICTION HOIST FOR SCOTTISH MINE

RECENTLY supplied by the Swedish ASEA Company to the National Coal Board is a push-button-operated friction hoist working with induction-motor drive and dynamic braking. It forms part of an order for four multi-rope hoists placed by the NCB and has been installed in a 1,850-ft. shaft at Seafield Colliery (East Fife).

The hoists are driven by three-phase induction motors, which can be used only in combination with d.c. braking. The speed is normally regulated by the service brake in combination with the reconnection in steps of secondary resistances and the motor. In the case of high speeds and large loads, however, the energy which has to be absorbed by the brakes leads to excessive heating, in which case retardation with the service brake is replaced by electrical braking.

The hoist installed at Seafield lifts a cage weighing 12.5 tons, carrying two 3-ton mine cars. The hoisting speed is 30 ft./sec. at 750 r.p.m., 900 h.p., and 6.6 kV. With the d.c. braking system, the hoist motor is disconnected from the network and is connected instead to a small d.c. generator.

ASEA reports having succeeded in developing a combined system with continuous-speed regulation down to creep speed irrespective of the load, as well as constant retardation. Extra safety is obtained by the two retarding systems working independently of each other.

During manual operation, the hoist is remotely controlled from a control desk at ground level by means of a controller lever and a braking lever. The braking lever actuates two reference potentiometers for the service brake and the d.c. braking system, which are electrically interconnected in such a way that each position on the brake lever corresponds to a certain fixed speed, irrespective of the size of the load.

When the hoist is being operated by push-buttons, the reference potentiometers controlled by the brake lever are replaced by two other potentiometers, which are driven direct from the hoist shaft during the retardation period. In this way the reference voltage, and consequently the speed of the hoist, will be directly dependent on the position of the cage in the shaft, and constant retardation is obtained.

When large loads are being hoisted, d.c. braking is often not required. A current relay, which senses the motor current during the period of full speed, decides whether the motor can remain connected to the network during the retardation. During the period of full speed, a power-direction relay also checks whether the hoist is driving, or being driven by, the load.

Stelvetite Wall Facing in Workshop

Stelvetite, the plastic-coated sheet steel produced by John Summers & Sons, Limited, Shotton, Chester, has been used to panel the inside walls of a recently completed single-storey building at Elm Works, Limited, London, S.W.17. The building comprises 10,000 sq. ft. and was erected as a workshop to cope with an overflow from the sheet-metal working and packing departments, and also to serve as a storage department and loading bay. It is constructed in pre-cast concrete with electrically heated floors and double glazing on the windows, the frames of which are in aluminium. The workshop was designed with the object of achieving maximum lighting and to ensure minimum maintenance. The inside wall facing, which is in white Stelvetite with a smooth glossy surface and trimmed with wooden beading, helps to achieve the desired lighting effect and lends itself to easy maintenance. A 2-in. insulation material separates the Stelvetite from the brickwork.

PRODUCTION OF bituminous coal and lignite in the US during June, according to the Bureau of Mines, US Department of the Interior, was 33,760,000 net tons, compared with 35,760,000 net tons in the previous month and 36,599,000 net tons in June, 1959.

Mining Oversea

in which we review, from time to time, interesting mining matters reported by our contemporaries abroad

WINDING FROM GREAT DEPTHS

IN an analysis of the merits of skipwinding compared with cage winding from shafts of 1,500 to 4,000 ft. depth, Polish engineers have concluded that cage-winding systems appear to approach the winding capacity of skip systems as the shaft depth and the size of the mine cars are increased. At greater depth, skipwinding systems do not in themselves offer adequate manriding capacity, and an additional cage system for riding men becomes necessary.

When planning a colliery shaft for a daily winding capacity of 8,500 tons of coal and 800 tons of dirt, equally divided between two levels at 2,370 ft. and at 2,930 ft., the skip system needs two skips of 10 tons capacity in one shaft, and two cages, each with four mine cars of 2½ tons capacity in the second shaft. The cage system would use two cages of three 5-ton capacity mine cars in each shaft. The total cost for winding engines, headgear, heapstead, shaft, and shaft insets is approximately 12 per cent. less for the cage version.—Z. KAWECKI, Przeglad Gorniczy, January, 1960.

NEW JIG DEVELOPMENTS

PRINCIPAL new feature of the latest small jigs developed by several German manufacturers is the quiescent discharge of the heavy product which remains unaffected by any pulsating movements of the separating liquid. Sealing and discharge devices, controlled by floats, are arranged in, or on the shale-extraction chambers. Fig. 1 shows the design of the SKB Company and it can be seen that there are no additional partitions between the compartment compared with jigs of previous design.

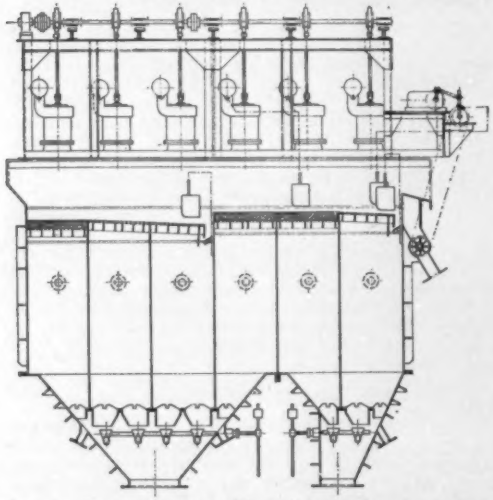


FIG. 1.—FEATURES OF A NEW JIG DESIGNED BY THE SKB COMPANY.

Feldspar compartments are installed beyond the extraction chambers for the heavy product. The new designs achieve a better precision of separation, combined with a shorter length of jigging bed. Similar improvements have been obtained for coarse and for middlings jigs by the addition of controlled flaps in the upper section of the extraction chambers or at the lower part of a contracted section of these chambers.—E. HOFFMAN, Glückauf, April 9, 1960.

SHAFT SINKING IN FRANCE

POST-WAR shaft sinking schemes in the French coalfields have suffered from the lack of standardization of shaft diameters, which varied from 17 to 25 ft. Neither the final headgear nor winding equipment was available as sinking proceeded, as in South Africa, nor the elaborate standardized sinking equipment as used in the USSR. French efforts to increase the rate of advance culminated in the construction of a hydraulically operated 5-ton crane with a pneumatic grab of 130 cu. yd./hr. mucking capacity. Simultaneous sinking and lining has also been successfully applied in selected cases.

Water difficulties were the main reason why no record figures were obtained in any French sinking project. Improvements are, however, expected from the elimination of any provisional shaft lining by means of suspended shaft rings, better drilling methods and holes of larger diameter, improved ventilation, and by more careful planning of the organization.

It is not thought that the records of South Africa or the USSR will ever be broken in France; rates of advance of 330 ft. of finished shaft per month are considered to be a sound practical aim for the future.—M. G. PAYRAT, Annales des Mines, February, 1960.

COAL FROM STEEP SEAMS

APPROXIMATELY one third of the Ruhr coal production comes from steep or semi-steep seams in which mechanization has not been introduced to the same extent as in level seams; thus. the labour costs are considerably higher.

The normal way of mining these steep seams is by longwall faces, advancing diagonally, and in order to make it possible to adopt simultaneous coal-getting and backfilling, a mat from plastic, reinforced with wire mesh, has been developed. It is laid across the face in 30- to 50-ft. strips which overlap by 1 to 2 ft., and the coal slides along one side of the chute thus formed, at the same time separating the working place from the backfilling space.

Attempts to introduce coal ploughs have not

been very successful. Coal cutters have had more success provided the face line was not diagonal, but to the full dip.—D. Wussow, Glückauf, February 27, 1960.

RUSSIAN COAL SAW

AFTER promising initial trials in 1957, the coal saw, type UVK-1 (Fig. 2), produced by the Lirov Works was installed in 10 collieries of the Donbas in 1958. At the Karl Marx Colliery it was won by the saw, while the lower 22 yd., seam with a dip of 68 deg. Only the upper 121 yd. was won by the saw, while the lower 22 yd., which served as a coal bunker and was kept 80 ft. in advance of the face line, was worked with air picks.

Between 30 and 40 men worked in three shifts per day to produce from 100 to 184 tons of coal per day. The average daily advance over four months was 3 ft. 3 in. The organization was:—First shift, coal-getting; second shift, roof support; third shift, chocks setting and timber supply.

The other collieries obtained similar average rates of advance. This is explained by unsuitable roof and flaking floor conditions and it is hoped to achieve daily advances of 8 ft. in a 2-ft. face producing 200 tons of coal per day. In hard coal the face line, which normally represents a catenary with 5 to 6 ft. deflection, acquires a deflection of up to 50 ft. over a face length of 110 to 140 yd. and this causes difficulties with roof control.—K. L. Ivanov, Ugol, February, 1960.

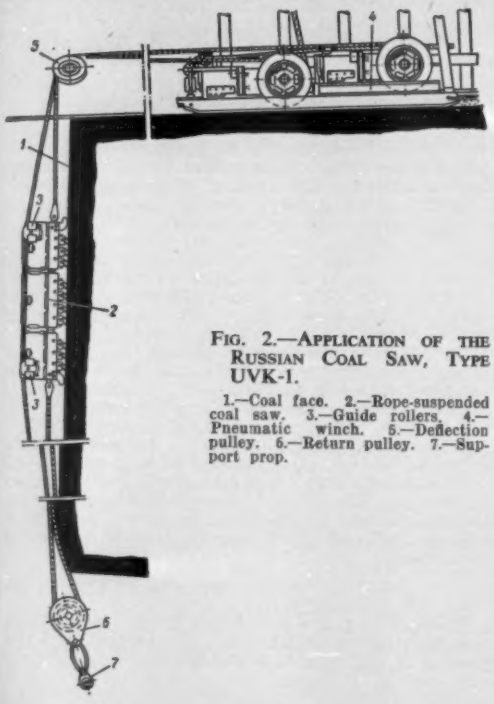


Fig. 2.—Application of the Russian Coal Saw, Type UVK-1.

1.—Coal face. 2.—Rope-suspended coal saw. 3.—Guide rollers. 4.—Pneumatic winch. 5.—Deflection pulley. 6.—Return pulley. 7.—Support prop.

ROCK PRESSURE RESEARCH

DURING the years prior to 1957, no efforts in manpower or apparatus were spared in a comprehensive investigation of rock-pressure problems in the Girondelle Seam at the Neumühl Colliery (Ruhr). The seam was being mined at a total length of 3,300 ft. to the strike and 2,600 ft. to the dip and was known to be subject to rock bursts. The most up-to-date instruments were used to measure changes in stresses and displacements in the roof strata, the coal, and in the waste in the hope of being able to predict forthcoming rock bursts.

This hope has not been fulfilled, but the data collected have given a clearer picture of the magnitude of the additional pressures in the zone in front of the working face and of the significance of relief displacements for the rock burst problem. The behaviour of stowed material in compression is also now better understood. The conclusion from the evaluation of the research data is that underground measurements alone do not supply a satisfactory answer because they only picture the sum of all geological and operational factors at any given moment.

Scale-model tests of plastic and elastic media are therefore to be given more prominence in future, although they cannot cover the effect of time, natural rock moisture, or variations of Young's modulus with stress. On the whole, it is felt that the painstaking efforts have unearthed more new problems than they have solved.—H. Sanders *et al.*, Glückauf, March 26, 1960.

VIBRATING COMPACTORS FOR MINE CARS

SEVERAL types of vibrating compactors have been designed by the Charkov Mining Institute for loading points underground in order to improve the filling of mine cars. In one lightweight version the vibrations are transmitted directly to the rails of the track on which the mine car stands. All compactors are driven by electric motors which are coupled through a reduction gear to two shafts with eccentric weights. Where wet conditions will not allow a floor-mounted electric motor, another version is available in which the compactor is suspended from a steel girder overhead and leans against the mine-car side.

The lighter floor-mounted version weighs 185 lb. and is suitable for 1½-ton mine cars. As the amplitude of the vibrations is only 0.006 in., no detrimental effects are expected on the rail track, but the field tests of this model have not yet been extensive enough to justify quantity production.—G. A. Ushakov and V. N. Korol, Ugol, March, 1960.

MECHANIZATION IN COLLIERY YARDS

DETERMINED efforts have been made by the Ruhr collieries to save labour and time in the colliery timber yards by the introduction of modern mechanical handling methods. Although the maximum savings can accrue only if the timber yard was laid out in the first instance for

mechanization, considerable economies have been achieved by the conversion of existing yards.

The main criterion for efficiency was found to be whether the amount of timber to be handled justified the capital expenditure for machinery and equipment such as fork trucks, mobile cranes, overhead gantry cranes, or diesel timber stackers with semi-circular gripping jaws. The proportion of the timber consumption to the size of the timber yard was also found to have a decisive influence on the costs. Particularly gratifying results were obtained whenever mechanization provided an opportunity to concentrate the supply of timber for several collieries in one single timber yard.—DR. H. LOWENS, Glückauf, May 7, 1960.

OUTBURST OF COAL AND GAS IN THE DONETZ

COAL and gas outburst in the No. 7/8 Kalinin Colliery in the Donetz coalfield, where a 2-ft. 9-in. seam of 13 deg. dip is being mined at a depth of 1,510 ft. from the surface, were found to occur at 50 to 55 ft. from the mothergate of a longwall advancing face.

The outbursts, occurring on November 2, 10, 26, and December 29, were all found to be confined to a zone of tectonic fissures in the roof and they all occurred immediately after the cutter loader jib had passed the disturbed zone. From 6 to 10 tons of coal were projected into the face. The frequency of the outburst was halved by the adoption of full caving of the wastes to replace the previous system of partial caving.—F. D. SHEVJAKOV, Ugol, March, 1960.

Colliery Accidents

FATALITIES caused by accidents at mines under the Mines and Quarries Act, 1954, in the second quarter of this year totalled 121, compared with 72 in the first quarter and 71 in the second quarter of 1959. The number of persons seriously injured was 382, compared with 441 in the first quarter and 440 in the second quarter of last year. Details are given in the following table:—

	Number of persons killed during the 13 weeks ended:		Number of persons seriously injured during the 13 weeks ended:	
	July 4, 1959.	July 2, 1960.	July 4, 1959.	July 2, 1960.
Underground—				
Explosions of fire-damp or coal dust	6	45*	2	2
Falls of ground ..	33	28	176	159
Haulage	18	20	141	102
Miscellaneous (including shaft accidents) ..	8	17	71	71
Total	65	110	390	334
Surface—				
All causes	6	11	50	48
Total underground and surface	71	121	440	382

* All 45 persons in this category were killed in the disaster at Six Bells Colliery (Mon) on June 28, 1960.

SELECTING THE BEST COAL AND PLANT FOR INDUSTRY

PRINCIPAL speaker at a dinner to be held in connection with the Combustion Engineering Association's forthcoming conference designed to assist industrial management and plant engineers in choosing the best coal and plant for their particular requirements will be Mr. Alfred Robens, who will then be deputy chairman and chairman designate of the National Coal Board. The conference will be held at the Hotel Majestic, Harrogate, on November 8 and 9. The chairman will be Mr. N. A. McNeill, engineer-in-chief, Unilever, Limited, and president of the association.

The conference will examine, from both the technical and the economic aspects, the choice of coal allied to the selection, operation, and maintenance of equipment for boiler plants and industrial furnaces and kilns, in order to achieve the maximum savings in capital and operating costs.

After an introduction by Dr. C. M. Cawley, chief scientist, Ministry of Power, and an address by a member of the NCB marketing department, three further sessions will discuss the practical and economic problems involved in operating and maintaining the plant, choosing new plant or extensions to existing plant, and new developments. Boiler plant and industrial furnaces and kilns will be dealt with separately in regard to operating and maintaining the plant, and to the choice of new plant or extensions to existing plant.

The conference will be open to non-members of the association; full details can be obtained from the Director, Combustion Engineering Association, 70, Jermyn Street, London, S.W.1.

Precautions in Use of Diesels Underground

PRECAUTIONS recommended by the US Bureau of Mines, Department of the Interior, in using diesel-powered equipment underground in non-coal mines and tunnels are given in Report of Investigations 5616, "Safety with Mobile Diesel-powered Equipment Underground." The report, describing bureau research on diesel engines, lists three primary safety requirements:—(1) Proper adjustment and maintenance of the engine; (2) suitable rapid dilution of the exhaust, and (3) adequate positive mechanical ventilation, both to remove exhaust gases and to restore oxygen consumed by the engine.

Carbon monoxide, carbon dioxide, and oxides of nitrogen are the principal harmful gases in diesel exhausts, according to the report. Concentration of carbon monoxide can be effectively controlled, the bureau says, by properly adjusting the engine's fuel-injection rate and seeing that it remains adjusted. Oxides of nitrogen cannot always be controlled by this method, hence an approved exhaust-gas dilution system is essential. The diluted gases of diesel combustion, including carbon dioxide, must be carried away from underground workers by adequate positive mechanical ventilation.

POLAND'S COAL EXPORTS during the first half of this year went up by 843,000 tons, as compared with last year, to an aggregate of 8,246,000 tons.

CORRESPONDENCE on the

Iron and Steel Industry in India

An article by Mr. G. Reginald Bashforth on "The Iron and Steel Industry in India" was published in IRON AND COAL *for October 23, 1959. Mr. V. D. Talmar, chief superintendent of the Bhilai steel project, has made some appreciative but critical comments on Mr. Bashforth's article and these are published below. A further article by Mr. Bashforth, in which he will discuss the future of steelmaking, with special reference to India, and also reply to Mr. Talmar's comments, will appear in next week's issue.*

MR. BASHFORTH's article provides interesting reading for those who are concerned with the progress of the steel industry in India. While his assessment of the raw material resources, mapping of the pre-development structure, and evaluation of present production programmes during the second plan period are all acceptable, his suggestions on the most suitable steelmaking process to be adopted for future expansion of the steelmaking industry in India are debatable for the following reasons.

Excess Process Scrap

(1) Mr. Bashforth rejects the idea of a straight open-hearth process to increase steel production in preference to the LD process, which, according to him, should be most suitable to Indian economy on account of its high rate of productivity, low capital costs, and lower scrap consuming capacity. He has taken great pains to explain the last mentioned aspect and has put forward the idea that the availability of excess process scrap by adopting LD process may be sufficient to dovetail an open-hearth plant to the LD process or to sustain two electric-arc furnaces of equal capacity to produce alloy and special steels needed by the country.

(2) We cannot agree with his statement that the open-hearth process is incapable of higher rates of productivity without consuming 40 per cent. of scrap in the total charge and so cannot dismiss from our attention the expansion of open-hearth production.

(3) His assumption that the LD process will consume only 10 per cent. of scrap for its charge, leaving the balance of 12 to 15 per cent. of the process scrap for other purposes, is not borne out by production statistics of the LD process published so far. Since clean process scrap has to be used as a coolant as well as diluent, its consumption varies in direct proportion to the metalloids, silicon, phosphorus, and manganese, present as impurities in the iron and whose removal by oxygen produces exothermic reaction in the LD converter.

Thus, the Canadian plant at Hamilton has published statistics in Steel, showing usage of scrap up to 25 per cent. on an iron analyzing 1 per cent. Si and 0.2 per cent. P while making soft steels from a 40-ton LD converter. Latest American practice at the Fontana plant of Kaiser Engineers reports the necessity to use scrap up to 34 per cent. of the total charge by weight for an iron analyzing 1.3 per cent. to 1.5 per cent. Si and over 0.3 per cent. P in a 35-ton LD converter.[1]

Indian Experience

In India we have been making iron on a commercial scale since 1909 in the private sector and after half a century commenced production in the public sector. From the results achieved so far practically and from the approximate estimates of our raw material resources presented by Mr. Bashforth in earlier learned articles[2, 3], we can safely conclude that our iron analyses will average 1 per cent. to 1.3 per cent. Si and 0.3 to 0.5 per cent. P and as such a LD unit will easily consume all the process scrap it produces. On such a scale of consumption, the advantageous scrap balance in favour of running an open-hearth unit or electric furnaces advocated by Mr. Bashforth proves to be unreal.

(4) Regarding other aspects of LD units, on the metallurgical side, limitations of process control and temperature control vitiate the LD process as they have affected other pneumatic processes of steelmaking in the past, and Mr. Bashforth fully admits this. However, the LD process is being practised successfully in many countries, though it should be remembered that the process has so far been used mostly for steel for flat products such as plates, sheets, strips, and also for wire products—all of soft steel—although it is claimed that high-carbon steel can also be produced.

(5) Though the capital cost of installation of a LD unit along with auxiliaries (for production of

oxygen and for dust and waste gas disposal) may be less than that for an open-hearth unit of equivalent productivity, the integration of the LD unit is possible only with a rolling mill designed to make flat products like slabs, plates, sheets, etc., which eventually makes the overall cost of the integrated plant equal to if not more than that of the open-hearth plant and rolling mills. Mr. Bashforth has admitted this paradox while describing the higher cost of installation of the Rourkela steel plant in comparison with Bhilai and Durgapur in his earlier article on the "Development Plans of Iron and Steel in India"[2].

(6) Although India has also forged ahead with this new oxygen process on a large scale in Rourkela, it would be rather premature to adjudge it to be best of all processes. An expert opinion of its efficiency under Indian conditions could be formed only after it has worked for a justifiable period of time.

Russian and American Developments

(7) Mr. Bashforth, obsessed with the idea of shortage of scrap in a country like India lacking in engineering industries and prepossessed with the remarkable progress of the newer oxygen process, has stated that "the erection of a straight open-hearth plant cannot be recommended since it demands adequate scrap supplies to achieve high rates of productivity." As a corollary to this, he further adds that "the suggestion to increase the capacity of the Bhilai plant by additional open-hearth furnaces seems to be contrary to modern trends and not entirely in the interests of Indian economy." He questions the ability of a 250-ton O-H furnace using a high percentage of hot metal to produce more than 22 ton/hr. and is doubtful of the better results anticipated from "all-basic" refractory furnaces. We believe we should not close our eyes to the developments taking place in the USSR and the United States.

Since the installation of the first 500-ton furnace at the Voroshilov plant in 1956, Russia has built larger units with basic refractories and obtained excellent results. Oxygen usage for efficient combustion of fuel and lancing through the roof for oxidation of the high metalloid content of the charge of 75 to 80 per cent. hot metal is practised, enabling a productivity rate of 40-42 ton/hr.[4] Later statistics from the USSR reveal average basic roof lives to be near about 500 heats for 180-ton furnaces, 400 heats for medium furnaces ranging in capacity from 250 to 350 tons, and above 350 heats for 380 to 500 tons. Checker life has improved by 15 to 25 per cent., and furnace availability ranges 94 to 96 per cent.

America's premier steel-making concern, the United States Steel Corporation, has introduced all-basic furnaces in its Gary Steelworks on the improved model with facilities for oxygen usage. High hot-metal charges in stationary open-hearth furnaces built of basic brick and provided with oxygen roof lances have not only increased productivity per operating hour, but have also raised furnace availability to about 95 per cent.[5]

In conclusion, on the basis of the foregoing and other considerations we feel that our decision to increase production by the O.-H. process by the improved method of utilizing basic refractories and oxygen to advantage in bigger units at Bhilai accords with the trends of the times in advanced countries. The present 250-ton stationary furnaces erected at Bhilai under Russian help and guidance are of modern design and have given quite encouraging results during the last few months of their operation.

REFERENCES.

[1] Iron and Steel Engineer, September, 1959, "LD Process for Making Basic Oxygen Steel."
[2] British Steelmaker, July, 1959, "Development Plans of Iron and Steel in India."
[3] British Steelmaker, September, 1959, "Development Plans of Iron and Steel in India."
[4] British Steelmaker, February, 1959, "Soviet Steel Expansion and Research."
[5] Journal of I.S.I., April, 1959, O. Pearson, "The Use of Oxygen in Duplex and Stationary and Open-hearth Practice."

Report on Bokaro Steel Plant Project

DESPITE the controversy which has surrounded the question of setting up a fourth steel plant in India at Bokaro during the concluding period of the Third Five-year Plan, steps necessary to take in hand the plant's construction during 1964-5 have been initiated by the Ministry of Steel, Mines, and Fuel. The preliminary project report of the plant, which is now being examined by Hindustan Steel, Limited, envisages a plant similar to the one at Rourkela in the method of producing steel as well as the end-products to be produced. The LD process is proposed for steel-making and, in view of the large shortage expected in flat products, it is proposed that Bokaro, like Rourkela, should initially produce sheets and plates exclusively.

The Indian firm of consultants which was asked to prepare the preliminary report had been told to provide in its proposals for the balanced future expansion of Bokaro for a plant of the largest size, having an annual capacity of 4,000,000 to 6,000,000 tons of ingots. Accordingly, the report has suggested large modern blast furnaces, steelmaking units, and rolling mills so as to produce 2,000,000 tons of ingots to begin with, and with provision for future expansion. If desired, it is stated that the Bokaro plant can be phased so that the plant will produce 1,000,000 tons in the first instance by 1965.

The consultants have pointed out that the average production cost of saleable steel in India has increased from about Rs.60 per ton in 1940 to about Rs.300 in 1959. During this period the cost of iron ore at the blast furnaces has gone up from Rs.5 per ton to about Rs.20 and labour cost has risen from Rs.20 per ton of steel produced to Rs.80.

The total capital cost of a 2,000,000-ton plant at Bokaro has been estimated by the consultants at Rs.2,150,000,000, excluding the cost of the township, new mines and quarries, washeries, etc.

COAL MARKETING IMPLICATIONS OF THE *Revised National Plan*

Discussion on NACM Conference Paper

In the paper which he gave at the 1960 annual conference of the National Association of Colliery Managers, Mr. R. H. E. Thomas, who retired on June 30 from his position as the National Coal Board's member for marketing, emphasized that the implications of the revision of the board's plans for the future were substantial. The paper was published in our July 1 issue (p. 15). A report of the ensuing discussion is given below.

MR. C. F. PALMER said that last winter many householders had to wait considerable periods for coal deliveries after placing their orders with the merchants—sometimes as long as six weeks. If they had chosen to use oil, they could probably have obtained deliveries within 24 hr.

Undoubtedly there was a tendency on the part of the public in general to leave the ordering of coal until the first onset of winter, and then both the merchants and the transport facilities were overloaded with orders. This indicated that the incentive of summer prices was not sufficient to encourage the average householder to fill his cellar in the summer months. Some additional attraction must be introduced.

Extended Credit

In some trades it was customary to give extended credit to customers at certain periods of the year in order to stimulate the demand. Did Mr. Thomas think that if the Coal Board gave three months' credit in respect of coal supplied during the months of, say, June, July, and August, that would assist in implementing the marketing plan, and avoid the costly stocking of coal at the source of production?

MR. THOMAS did not think that the giving of three months' credit by the board would help at the moment; the merchants would probably get service more cheaply from the banks than the figure which the board would be willing to charge.

The objective must be to ensure that the maximum amount of coal was stocked by consumers, and the board and the trade could only do so by exhortation. If the merchants had adequate stocks to begin with, the board must ensure that those stocks were maintained; that was achieved last winter and would be achieved in the coming winter.

MR. G. W. SANDERS, pointing out that the nationalization Act did not provide for the board to take over the selling organization, said he understood that only 5 per cent. of the national output was sold direct by the board. Times had changed, and there was now an urgent need for the board to ensure that its reputation was not damaged by dull, unimaginative, or often downright bad service from dealers, some of whom had a stake in oil anyway. The technical advice now being provided in itself would not suffice. The board must set out to exercise firm control over the sellers who dealt direct with the board's customers.

Improved Service

MR. THOMAS said it was true that the board sold only a small percentage of its output direct to domestic consumers. It would require the expenditure of a great deal of money to set up a retail service, and the board, with all its troubles, did not feel that it should go into retail distribution yet. But it could try to improve the service given by the 16,000 retailers. There were many consumers who preferred to go to the distributors. Coal for electricity generation was sold direct by the board; the railways, Imperial Chemical Industries, and other organizations bought direct. There were distributors who sold oil as well as coal; if coal were taken away from them they would concentrate exclusively on oil.

The coal industry was ensuring now that the voice of coal was heard by every consumer in the country. The board needed all the help it could get at the present time and they needed the good will. There was a lot of sentiment in regard to coal, and there were customers who had done business with their suppliers over several generations.

A speaker commented on the statement in the paper that in the past goodwill and markets were lost because coal supplies were below standard, due to shortage at a time when quantity had to be put before other considerations. Coal, if it was to compete effectively with oil, which was consistent in quality, must be equally consistent. There could be no doubt that by washing and further preparation it was possible to produce consistent qualities of coal. There were still many pits without first-class washeries. Coal seams varied in ash content, and this had an adverse effect. He asked for Mr. Thomas's comments.

MR. THOMAS replied that he had plenty of views

on the matter. How the job was done was a matter for the production side; if they wanted cleaning facilities they should ask for them. Obviously the job could be done; he could not tell them how, for he was not an engineer, but he did know that other people could do it, and they could do it. The challenge could not be left on one side; he wanted it pressed. The trouble began below ground, and he wanted the coal brought out of the pits in better condition. He knew that was difficult, but that was where the solution lay.

MR. F. T. MURPHY said that in order to achieve sales abroad, coal was being shipped in some instances at a loss of over £2 per ton. He asked Mr. Thomas how long it would be before economic prices could be realized.

Surfeit of Coal

MR. THOMAS said he believed an improvement was likely to show itself. The American freight market was a dominating factor in settling the price at which Britain could sell abroad for the next two or three years. It must not be forgotten that there was a surfeit of coal throughout the world. He nevertheless foresaw a gradual improvement in the price situation.

MR. T. SMITH, (Scottish Branch) commented that methods of production were always determined by marketing requirements. Mr. Thomas had stressed the importance of productivity; on the other hand, he had said that the industry must satisfy the requirements of the market in regard to quality and size. These two considerations left the production staff in a dilemma. The highest productivity machine they had at the moment was the Anderton shearer, and it did not produce the sizes required at present. No doubt there would be changes in the future. Taking due notice of the fact that it was difficult to change production methods in the mines, would Mr. Thomas advise the continued use of the really productive Anderton shearer and at the same time the introduction of other machines so that the industry would maintain good productivity in the mines and still meet the quality demands in the future?

MR. THOMAS said he appreciated the difficulty on the production side; they had really to reconcile irreconcilables. While they must strive for productivity, they must also produce the coals which the consumers would buy. It was of no use producing adequate quantities of coal if they could not sell it. The problem of large coal was very much with them at the present time. But he thought that over a period of years the market would change, because the Central Electricity Generating Board was taking one third of the total coal production in the country and the demand would go up. Mr. Smith's difficulty would disappear in time.

MR. H. L. RHODES quoted from a report in a newspaper on the previous day stating that the North Thames Gas Board had put in a gasification plant which used a new process, because of the shortage of coking coal. He asked if that meant that the "Revised Plan for Coal" already needed revision. On the question of distribution he asked if the Coal Board honestly believed that it was able to compete with the merchants. For instance, could the board provide a better service than that of Charringtons in London? He asked if the turn-round of NCB lorries could be improved, because a merchant was able to turn round twice as quickly as the NCB lorries.

MR. THOMAS replied that it was not true that there was a shortage of coking coal. Concerning retail service, he would say that the model for distribution was in Lancashire. He pointed out that, generally speaking, NCB lorries were governed by labour relations, and the board could not get out of them the same degree of work as others did from their lorries. The board's service was as well organized as it could be.

Sales Force

A member said that it had been stated that, following the war, it was not possible to concentrate on the sales force. The inference was that, if it had been possible, the result would have been to make the task of getting the coal more difficult. Any supplier, however, had an obligation to render the best possible service to the consumer, even when the product was in short supply. He asked if Mr. Thomas considered that the policy not to build up a sales force was the wisest policy.

MR. THOMAS said the trouble was that nobody in the coal business bothered about the consumer during the years from 1939 to 1947. The Ministry of Fuel in those days had a technical force whose job was to persuade industrial consumers to burn the lowest grade of coal on which they could manage. That was symptomatic of the attitude of mind in that period, and not unnaturally the board had listened to the voice of the country, that more coal was required; the emphasis was on the amount of coal needed and the sales aspect had to be adapted accordingly. He did not think the position was really so bad, bearing in mind that right up to 1957 there was never enough coal to satisfy the consumers. He admitted the implication that the board might perhaps have started building up a sales force a little earlier than it did.

MR. W. DUNCAN, commenting that the NCB had contributed liberally to the funds of the Coal Utilization Council, asked what sort of organization it was. He did not think the CUC had aroused as much interest in coal in the minds of the people throughout the country as one might have hoped.

MR. THOMAS said it was true that the CUC had not made as much impact as it might have done. It was a body comprising the distributors, the Coal Board, and the appliance makers. It could only do what it was trying to do if it had sufficient money. The board was increasing its support of the CUC.

Vote of Thanks

MR. E. L. EVANS, expressing the thanks of the meeting to Mr. Thomas, said that his duty

became a pleasure, because Mr. Thomas had pleased his audience greatly by his masterly paper, which had provoked a very interesting dicussion. Some of those who were working in the coalfields were often the butt of the remarks which were made about coal and coal supplies. It was very interesting, therefore, to note the emphasis which was to be placed on technical and general service to the consumers in the future. He felt Mr. Thomas would have gathered from the discussion that there should be perhaps equal emphasis on distribution in the future—distribution in its wider sense, not in the present conventionalized form of putting coal into sacks and distributing it by means of lorries. Mr. Evans felt that the marketing and scientific experts had got to look for improved methods to reduce distribution costs.

The meeting was grateful that Mr. Thomas had taken considerable trouble to prepare a detailed paper and had come to Southport to present it so lucidly, said Mr. Evans. It pandered to the ego of the audience that they should have a paper so well prepared, and one which did not insult their intelligence. At the same time it had spanned some of the gaps in their knowledge, and had rounded off a conference in which board members had brought managers fairly and squarely into perspective with the current problems of the industry by presenting a number of really good technical papers.

It had been said by the chairman of the meeting (Mr. G. Inverarity) that for Mr. Thomas this was the occasion of his swan song. It was hail and farewell. The members hailed with gratitude his support for their association and for their individual efforts in the coalfields; they sent him their farewell greetings from the industry, and they trusted that his retirement would provide a sphere of human activity which had no problems, but only pleasures.

Multi-purpose Trestle

SCAFFOLDING at collieries is in almost continuous use, and if properly constructed, the orthodox scaffold is often costly and cumbersome if maximum safety is to be assured, while much time and labour can be expended both in erection and dismantling. A makeshift scaffold is never satisfactory as, apart from it being generally inadequate to allow a job to be satisfactorily carried out, it can be a source of danger to life and limb.

FIG. 1.—THE "UNIMER" MULTI-PURPOSE TRESTLE USED AS A CONVEYOR BRIDGE.

A trestle unit, supplied by Safety in Mines Development, Limited, 2, Leslie Road, Gregory Boulevard, Nottingham, has been developed which should prove invaluable as a labour saving and safety device for a large variety of uses both underground and at the surface. Designated the "Unimer" safety trestle, this unit is manufactured in Britain under British patent rights.

The trestle, which is made from steel tubing of BS specification in components easy to handle, is constructed in a variety of types and sizes, and can be either rigid or telescopic. Of the fixed or rigid type, height sizes vary from 1 ft. 4 in. in convenient multiples to 4 ft. 11 in. The telescopic type has approximate heights from 2 ft. 3 in., extending to 3 ft. 7 in. in multiples, to 4 ft. 7 in., extending to 6 ft. 6 in. When used for scaffolding the usual practice is to have a platform of 4-in. by 3-in. wooden battens.

The application of such trestles for underground work at ripping lips, back-ripping lips, stone drivages, and building brick stoppings and for surface building operations is particularly suitable, as the components, when dismantled, are so easy to stack and occupy only the minimum space.

Another application of the "Unimer" safety trestle is the bridging of trunk or gate conveyors at essential points, thus eliminating the dangerous practice of persons climbing over the conveyor when in motion. An illustration of this application is shown in Fig. 1. The bridge is constructed from a trestle of the telescopic type and the platform designed to form the bridge is made up of three wooden battens of 9-in. by 3-in. section some 10 ft. long. A tubular telescopic hand rail is provided which is easily fixed to the main structure to provide maximum safety.

Pig-iron and Steel Production

STATISTICAL SUMMARY

IN the following United Kingdom pig-iron and steel statistics, issued jointly by the Iron and Steel Board and the British Iron and Steel Federation, Table 1 gives the production of pig-iron and ferro-alloys and the number of furnaces in blast in June. Table 2 gives the production of steel ingots and castings in June and Table 3 gives details of deliveries of finished steel in May last. Activities of the industry are summarized in Table 4.

TABLE 1.—*Weekly Average Production of Pig-iron and Ferro-alloys in June*, 1960. (*Thousands of Tons.*)

District.	Furnaces in blast.	Hematite.	Basic.	Foundry.	Forge.	Ferro-alloys.	Total.
Derbys, Leics, Notts, Northants, and Essex	19	—	30.4	19.9	0.1	—	50.4
Lancs (excl. N.W. Coast), Denbighs, Flints, and Cheshire	7	—	18.4	—	—	1.8	20.2
Yorkshire (excl. N.E. Coast and Sheffield)	—	—	—	—	—	—	—
Lincolnshire	8	—	36.7	—	—	—	36.7
North-East Coast	17	2.4	60.1	—	—	1.4	63.9
Scotland	7	0.6	25.2	0.8	—	—	26.6
Staffs, Shrops, Worcs, and Warwicks	5	—	10.9	1.1	—	—	12.0
S. Wales and Monmouthshire	11	2.7	59.6	0.9	—	—	63.2
Sheffield	2	—	3.5	—	—	—	3.5
North-West Coast	8	15.8	—	1.6	—	1.3	18.7
Total	84	21.5	244.8	24.3	0.1	4.5	295.2*
May, 1960	85	22.0	245.7	26.6	0.2	4.6	299.1
June, 1959*	77	18.1	193.4	19.6	1.2	3.0	235.3

TABLE 3.—*Weekly Average Deliveries of New Non-alloy and Alloy Finished Steel.* (*Thousands of Tons.*)

Product.	1958.	1959.	1959. May.	1960. April.	1960. May.
Non-alloy Steel:					
Ingots, blooms, billets, and slabs‡	4.6	5.1	5.1	5.8	5.8
Heavy rails	10.2	6.8	7.3	9.3	11.1
Sleepers	1.2	0.6	0.5	0.5	1.8
Fishplates and soleplates	0.7	0.4	0.6	0.7	0.9
Plates, 3 mm. thick and over:					
(i) Over ⅜ in. thick	29.6	24.8	23.8	31.3	31.9
(ii) Under ⅜ in.	17.7	18.3	18.8	23 9	24.1
Other heavy prod.	41.8	41.2	41.4	56 5	53.2
Ferro-concrete bars	7.6	9.6	8.7	10 2	11.6
Wire rods	21.5	23.5	24.2	29 8	30 8
Arches, etc.	8.6	7.8	8.5	8.6	9 3
Other light sections	29.1	33 0	30.5	41.7	44.2
Bright steel bars	6.2	7.6	7.1	10 0	10.7
Hot-rolled strip	22.6	27.4	26.9	33.8	35.8
Cold-rolled strip	7.0	8.0	7.3	9.9	11.2
Sheets, including coated:					
(i) Hot rolled	10.6	11.8	10.1	13.5	14.0
(ii) Cold reduced	31.1	35.2	34.7	40.2	42.8
Tinplate:					
(i) Hot dipped	8.4	7.7	8.1	9 2	9.0
(ii) Electrolytic	10.3	13.2	12.4	15 2	15.6
Blackplate	0.8	0.7	0.6	0.8	1.0
Tubes up to 16 in.	19.0	20.6	18.1	24.1	26.7
Tube fittings, etc.	0.4	0.4	0.4	0.4	0.4
Tyres, wheels, and axles	4.5	2.4	2.6	2.3	2.9
Forgings (excl. drop)	2.6	2.1	2.5	2 2	2.5
Steel castings	4.2	3.6	3.7	4 0	4.4
Tool steel	0.2	0.2	0.3	0.2	0.3
Total	300.5	312.0	304.2	384.1	402.0
Alloy steel	16.1	18.2	17.4	22.5	25.1
Total deliveries from UK prod.†	316.6	330.2	321.6	406.6	427.1
Add: Imported finished steel	7.0	7.1	8.3	23.2	26.9
	323.6	337.3	329.9	429.8	454.0
Deduct: Intra-industry conversion§	41.2	47.6	46.5	62.0	62.0
Total new material	282.4	289 7	283.4	367 8	392.0

† Includes finished steel made from imported ingots and semis.
‡ Other than for conversion into any other form of steel listed.
§ Material for conversion into other products also listed in this table.

TABLE 2.—*Weekly Average Production of Steel Ingots and Castings in June*, 1960. (*Thousands of Tons.*)

District.	Open-hearth. Acid.	Open-hearth. Basic.	Bessemer.	Electric.	All other.	Total. Ingots.	Total. Castings.	Total ingots and castings.
Derbys, Leics, Northants, and Essex	—	5.0	14.9 (basic)	2.6	0.1	21.1	1.5	22.6
Lancs (excl. N.W. Coast), Denbighs, Flints, and Cheshire	1.3	39.4	—	5.4	0.4	45.1	1.4	45.2
Yorkshire (excl. N.E. Coast and Sheffield)								1.3
Lincolnshire	—	46.5	—	—	0.1	46.5	0.1	46.6
North-East Coast	0.7	86.9	—	1.6	0.4	87.6	2.0	89.6
Scotland	1.1	49.5	—	4.1	—	52.6	2.1	54.7
Staffs, Shrops, Worcs, and Warwicks	—	23.5	—	4.4	0.7	26.8	1.8	28.6
S. Wales and Monmouthshire	2.0	91.8	15.9 (basic)	0.8	0.1	110.2	0.4	110.6
Sheffield (incl. small tonnage in Manchester)	8.1	38.7	—	13.5	0.4	58.8	1.9	60.7
North-West Coast	—	—	5.7 (acid)	0.8	—	6.4	0.1	6.5
Total	13.2	381.3	36.5	33.2	2.2	455.1	11.3	466.4
May, 1960	14.7	385.2	38.9	34.4	2.2	463.6	11.8	475.4
June, 1959*	13.5	320.8	24.9	27.2	2.1	378.3	10.2	388.5

TABLE 4.—*Iron and Steel Index and General Summary of Pig-iron and Steel Production.* (*Weekly Average in Thousands of Tons.*)

Period.	B.o.T. Price Index, 1938 = 100. Iron and steel.	Coal.	Basic materials§	Iron-ore output.	Imported ore used.	Coke sent to blast furnaces.	Pig-iron, ferro-alloys prod.	Scrap used in steel prod.	Steel (incl. alloy). Imports.†	Prod. ingots, castings.	Delivrs. finished steel.	Stocks.‡
1958	343	403	478	276	262	227	245	196	9	369	284	2,242
1959	340	497	477	286	244	210	242	208	7	388	291	2,244
1960—March*	337	502	487	347	325	262	312	286	19	485	376	2,243
April	338	502	488	326	329	265	311	251	23	478	369	2,292
May	338	483	489	337	317	261	299	252	27	475	393	2,248
June*	339	483	489	297	314	261	295	247	38	466	362	2,329

* Months contain five weeks, all tables. ‡ Stocks, ingots, semi-finished and finished steel, at the end of the years and months shown.
† Weekly average of calendar month. § Used in non-food manufacturing industries.

Progress in Wedge-belt Drives

APTLY naming its new wedge-belt drive the "SpacesaVer," J. H. Fenner & Company, Limited, Marfleet, Hull, claims that it literally puts a quart of power into a pint of space. The width and weight of drives are reduced by a half and the cost by at least a fifth (see illustration).

The much greater power capacity comes from the use of modern materials now available, combined with back-room work on the cross-section of the belt itself, which makes full use of the strength and flexibility of Terylene cords for pulling the load. These are encased in and absolutely bonded to a synthetic rubber which gives great section stability, keeping the load-carrying cords exactly where they can do most work with least stress to themselves. The rubber used also gives bonus features of heat and oil resistance and adequate electrical conductivity. These have hitherto been the subject of surcharges. Along with the wedge-belts, new pulley designs take full advantage of modern controlled casting methods to give stronger, yet lighter pulleys.

Only two wedge-belt sections, $\frac{1}{2}$ in. (Alpha section) and $\frac{5}{8}$ in. (Beta section), are needed to cover every normal drive up to 200 h.p. The range of belt lengths and pulley diameters has been skilfully selected, on international standardization principles, to give complete coverage of all usual drive requirements.

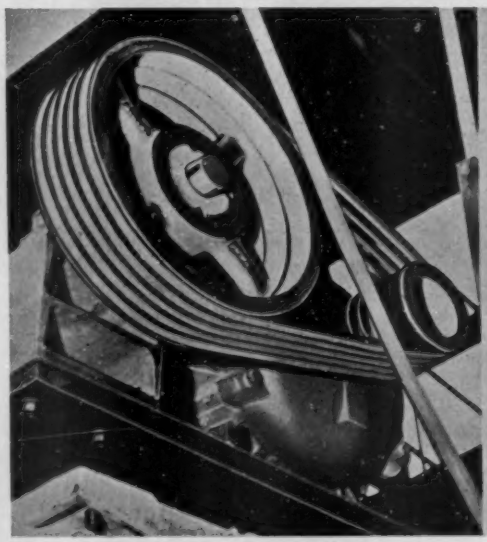
BOOK REVIEW

Data Sheets on Dust Collectors. British Steel Castings Research Association, East Bank Road, Sheffield 2. 40 pp. Illustrated. 30s., postage paid.

EQUIPMENT for the collection of industrial dusts and fume has attracted considerable attention, particularly since the passing of the Clean Air Act, the implementation of which will in numerous cases involve the purchase, installation, and regular maintenance of such equipment, not merely by makers of steel castings, but also by many organizations engaged in other sectors of industry. Many different types of dust collectors have been introduced to the market under various trade names in recent years, making it increasingly difficult for potential users of such equipment to keep abreast of developments in this specialized field.

In order to facilitate the selection of the most suitable unit for a particular purpose, the British Steel Castings Research Association broke new ground by compiling a series of data sheets, giving up-to-date details of specific dust collectors suited primarily to steelfoundry applications. A book, containing these data sheets, was first published in May, 1958, in an edition limited to members of the BSCRA. The association has now made this book generally available in a second (revised and enlarged) edition.

The data sheets included in this book contain details of 32 dust collectors made by 19 organizations, and as far as possible, the collection efficiency, pressure drop, and water usage of each type of collector are clearly indicated. A diagram, showing the principle of operation, is given in each case. An introduction, containing comments on types, selection, location, and the approximate cost of dust collectors, as well as a table of efficiency curves for each type of collector, are also included in the book, the timely appearance of which will be of value.



V-BELT DRIVE.

SPACESAVER WEDGE-BELT DRIVE.

Coalfield News

Cash Award for Colliery Blacksmith

A DEVICE which enables the quick return of an empty tub after unloading by passing through a rotary tipler, has won a cash award for the inventor, Mr. Oliver Turnbull, a blacksmith at Brancepeth Colliery (Co. Durham). The device eliminates the necessity of a large roundabout for the tub to return to the starting point.

The NCB's scheme for awards for ideas and invention in the technical field is open to all its employees and has been in operation for many years. The awards are made on the basis of use of the invention or idea, its originality, and financial saving over other methods.

VIEWS on the merits of a winter and summer price scheme for coal in Northern Ireland are invited by the Northern Ireland Domestic Coal Liaison Committee.

DIAMOND wedding anniversary was celebrated by Mr. and Mrs. Charles Munday on Friday last. Mr. Munday worked at Ireland Colliery (Derbyshire) for over 50 years, for 30 of them as a deputy.

COAL SHIPMENTS from the River Wear during the first six months of the year, at 1,206,010 tons, were 78,091 tons better than in the corresponding period of 1959. Exports rose by 80,850 tons to 181,720 tons.

USHAW COLLIERY (Co. Durham), in which only the Harvey Seam was being worked, has now been closed. Of the 150 miners employed there, 133 have been transferred to other pits or are retained on salvage work.

SEPTEMBER EDITION of "Mining Review," the NCB newsreel, contains items on an amateur house builder, coal used by the Express Dairies, Limited, a geo-thermal power station in New Zealand, and hydraulic mining at Trelewis.

MEMBERS of the National Union of General and Municipal Workers at Manvers Main coke ovens, near Mexborough (Yorks) said on Wednesday that unless a demand for a 5s. per shift rise was met they would strike in 21 days' time. If there is a strike about 600 men will be affected.

BREAKDOWN in the ventilation system at Blidworth Colliery, near Mansfield, on Tuesday resulted in about 3,500 tons of coal being lost. Production was held up while repairs to a motor driving the main ventilation fan were carried out. Miners were meanwhile found alternative work at the colliery. Work returned to normal the same evening.

A WEEK-OLD STRIKE at Manvers Main Colliery (Yorks) ended on Monday. On the previous Monday 16 miners in the Haigh Moor Seam asked for permission to leave the pit early because of water on the floor. It was refused and they therefore walked out. The strike led to a complete stoppage of work in the seam.

ONE OF THE FINEST youth centres in Fife—Lochore House, Ballingry—was opened on Monday by Mr. Abe Moffat, president of the Scottish executive of the National Union of Mineworkers. It was the inspiration of Mr. Malcolm M. McGugan, manager of Mary Colliery, to convert the house into a youth centre and the idea was adopted by the Lochore Miners' Welfare Institute.

WORKERS at Rothes Colliery (Fife) decided at a pithead meeting on Monday to ask the NCB about their future prospects following measures introduced by the board in its economy drive. Production has been pegged at 1,000 tons a day, compared with the original target of 5,000 tons, and low level developments have been suspended. It was decided to raise the question at Area and Divisional levels.

SECTION OF Argyll Colliery, at Machrihanish, is to be flooded in an effort to put out a fire there. NCB engineers are uncertain of the extent of the fire and the pit staff are at present on holiday. Flooding will take several days to complete and afterwards experts will carry out tests to see what effect it has had. The colliery was re-opened shortly after nationalization and produces 650 tons a week.

NEW CONDITIONS have been announced by Sheffield University concerning this year's Arthur Markham Memorial Prize, which is offered for literary work submitted by manual workers in the coal industry. Any coalfield worker who is or has been earning a daily or weekly wage is eligible for the prize of £50 which will be awarded for the best one-act play in prose, five poems, a short story, or the first chapter of a novel.

STRIKE of deputies brought Bentley Colliery (Yorks) to a standstill during the morning and afternoon shifts on Wednesday. Mr. L. Wormald, national president of the National Association of Colliery Overmen, Deputies and Shotfirers, who attended the local branch meeting, said the reason for the dispute was that the undermen at the pit were not being replaced when they left. The shortage of deputies was causing extra work for the 104 deputies still at the pit.

STEPS are being considered to have Rotherham made the permanent venue of the Yorkshire miners' annual rally, Mr. T. Ryan, secretary of Aldwarke branch of the National Union of Mineworkers, told Rotherham Trades Council on Tuesday. He said that this was the miners' retort to a letter from Rotherham Chamber of Trade to the borough council complaining that the recent rally had been "disastrous" to retail trade, and urging that no more should be allowed in the town.

SHIPMENTS OF COAL and coke from the South Wales ports last week improved by 9,895 tons over the previous week, but were 1,146 tons below the level of a year ago. The total was 43,808 tons. Shipments from the various ports in the week ended August 14, 1960, with the figure for August 13, 1959, in parentheses were: Newport, 3,258 (13,867) tons; Cardiff, 5,632 (4,745) tons; Penarth, 1,758 (1,337) tons; Barry, 12,922 (7,907) tons; Port Talbot, 1,226 (nil) tons; Swansea, 19,012 (17,098 tons).

COAL OUTPUT in the West Midlands Division of the NCB in the four weeks ended July 30, was 956,370 tons, which was 12.7 per cent. less than in the same period last year. Output for the year to date was 8,598,000 tons—1,001,000 tons, or 10.4 per cent. less than in the first seven months of 1959. Output per manshift in July was 89.96 cwt. at the face and 27.2 cwt. for all employed. Manpower totalled 44,405 on August 1, or 8,490 less than a year ago and a reduction of 5,283 since January 2.

YOUNG MINING TRAINEES who had just completed their course at the No. 3 Area training centre of the East Midlands Divisional Coal Board received awards from Mr. W. L. Miron, deputy chairman of the division, on Thursday of last week. Clipstone and Welbeck colliery teams won the inter-colliery first-aid and fire-fighting competitions and the principal prize-winners were D. Bower (Mansfield Colliery), P. Dean and A. Wharton (Shirebrook Colliery), K. Walker (Bevercotes Colliery), T. Sheppard (Clipstone Colliery), and T. Shorthouse (Bilsthorpe Colliery).

BEANS INDUSTRIES, LIMITED—Mr. W. Barnes has resigned as managing director.

THE COAL TRADE

IMPROVEMENT noted last week in the household trade has been maintained and is now on a level considerably above that of a year ago. In some cases the forward position is giving cause for some concern, especially in view of the obvious labour shortage at many pits. Trade in coke is still sluggish and will have to revive considerably if any impression is to be made upon the accumulated ground stocks. Industry is gradually getting back into full post-holiday production and in almost all areas the market for industrial qualities has strengthened.

NORTH WALES

The pits resumed work this week after the annual holiday and met a ready demand from merchants. The inclement weather is influencing consumers and stocking is now well under way. All grades of coal are readily available, with the exception of the better grades of anthracite stovesse. Supplies of this fuel have recently been easier but it would appear that the position has now reverted to the previous one of scarcity. Fortunately, there are liberal supplies of "Phurnacite" available and this is being accepted as a substitute.

The call for all grades of coke is slight since the central heating sector of the market is still in its summer period. The ovens continue production and adequate tonnages are on hand. In the industrial field a steady flow of business is maintained and all requirements are catered for satisfactorily.

NOTTINGHAMSHIRE

Recent improvement in sales of house coal is continuing, and the volume of orders for August is surprisingly heavy. Merchants report shortage of some grades, particularly of the larger varieties. Pit holidays have aggragvated the position, and the reduced output has had the effect of seven to 10 days' delay in some domestic deliveries. The public seem to be more coal conscious, and the steady demand is increasing. Only occasional additional tonnages are offered, but some nuts are fairly free and easy to obtain.

Both gas and hard coke for domestic use show increased demands, but here a plentiful supply is available. Orders for smokeless fuels are maintained, and apart from slight delays, the supply position is quite good. "Phurnacite" supplies are quite adequate, but anthracite nuts are much in arrears. Little change is reported from the industrial sector, where supplies are flowing quite well.

New Seams Will Extend Life of Yorkshire Pit

TRANSFER of all work to a new reserve of coal and the complete mechanization of the pit will add 20 years to the life of Manor Colliery, Wakefield (Yorks). and double its 300-ton daily output. Production from the new area is expected to begin towards the end of next year, said Mr. H. Saul, general manager of the No. 7 (Wakefield) Area of the North Eastern Divisional Coal Board on Tuesday. When complete, the development will have cost about £250.000.

The area of coal at present being worked is nearly exhausted, making it necessary to develop the new area, which is at a different level and is separated from the present workings by a series of faults. It has had to be approached by two 1.000-yd. tunnels driven from the shaft 80 yds. above the present pit bottom.

Coal Production Down by 6.5 Per Cent.

OUTPUT of coal so far this year is about 6.5 per cent. less than in the corresponding period of 1959. Open-cast production has fallen by about 32 per cent. and deep-mined by 5 per cent. Stocks are beginning to fall again after hovering near the 35,000,000-ton mark for some weeks. Last week they fell to 34,463,000 tons from the previous week's total of 34,665,000 tons, but they are still higher than the figure of 30,300,000 tons in the same week of 1959.

There were 593,300 wage-earners on colliery books on August 6, against 654,200 on August 8, 1959, the numbers engaged at the coal face being 226,500 and 255,100 respectively. Total absenteeism (all workers) in the week ended August 6 was 16.59 per cent. compared with 16.13 per cent. in the week ended August 8, 1959. Output at the face was 3.619 tons and overall 1.184 in the week ended August 6, compared with 3.420 and 1.150 tons in the week ended August 8.

The following table gives (in tons) the output of saleable mined coal by division in the week ended August 13, and the tonnage lost through all causes (holidays, disputes, and go-slows):—

Division.	Week ended August 13, 1960.		Week ended August 15, 1959.
	Total output.	Tonnage lost.	Total output.
Scottish	320,100	25,400	336,100
Northern (N&C) ..	178,200	65,000	199,100
Durham	331,500	126,900	364,000
North-Eastern ..	623,000	189,200	646,200
North-Western ..	240,300	8,200	268,500
East Midlands ..	623,000	236,900	671,700
West Midlands ..	153,700	105,800	173,500
South-Western ..	241,700	150,800	282,100
South-Eastern ..	26,600	—	27,900
Great Britain—			
Deep-mined coal ..	2,738,100	908,200	2,969,100
Other deep-mined (including licensed mines) ..	33,400	—	41,800
Open-cast coal ..	159,500	—	193,500
TOTAL	2,931,000	908,200	3,204,400

SUPPLIES OF PTFE glass fabrics made by Wandleside Warren Wire Company, Limited, Dunmurry, Northern Ireland, will in future be marketed through the textile division of Henry Simon, Limited, Cheadle Heath, Stockport (Lancs), and its subsidiaries. Inquiries will also be dealt with by Wandleside Cable Works, Limited, 106, Garratt Lane, Wandsworth, London, S.W.18.

Appointments

New Marketing Posts in Durham Division NCB

DURHAM Divisional Coal Board announces the appointment of Mr. E. S. MILBURN, who is at present divisional marketing manager, to succeed Mr. A. S. BEAN as deputy marketing director. Mr. Bean was recently appointed marketing director for the division. With the increasing importance of coke sales, the board has appointed Mr. J. Y. FEGGETTER, at present divisional marketing officer (carbonization), as a deputy marketing director.

Mr. Milburn, who is 45, has had a long association with the marketing side of the mining industry, starting with the Throckley Coal Company, Limited. Since vesting date he has held posts in the marketing department of the old Northern Division and the Durham Division, where he has been divisional marketing officer since 1957. Mr. Feggetter is 60, and served with Priestman Collieries, Limited, from 1915 until 1946 when he was sales manager, and since vesting date has held the post of divisional marketing officer (carbonization).

Mr. J. H. READMAN has been appointed chief finance officer in succession to Mr. F. H. Newman, who was recently appointed finance director of the board. Mr. Readman has been chief accountant in No. 6 Area of the division since 1956.

Mr. ERIC NEWBIGGING has joined Stanley Works (GB), Limited, makers of joiners' tools, of Sheffield, as sales promotion manager. Mr. Newbigging, who is 38, was previously sales promotion manager of Parkinson Cowan Appliances, Limited.

Mr. THOMAS ARBLASTER, manager of the Shireoaks Colliery (Notts) since June, has been appointed manager of Thurcroft Colliery (Yorks). Before going to Shireoaks, Mr. Arblaster was "spare" manager for the No. 1 (Worksop) Area, North-Eastern Divisional Coal Board.

In recording the appointment, in our August 5 issue, of Mr. JAMES LIPSCOMBE as full-time representative in London of Thomas Millington & Company, Limited, we described the firm as being steel stockholders, whereas it prefers the description of tool steel manufacturers.

Mr. ROBERT LEEMING has been appointed sales representative for Yorkshire, Nottinghamshire, and North-east England, for C. T. Skelton & Company, Limited, makers of contractors' and garden tools, of Sheffield. He succeeds Mr. W. F. H. Nicholls, who is to handle the company's advertising.

Mr. REGINALD A. PALMER, who has been appointed to the newly-created post of assistant superintendent engineer of the Palm Line, Limited, shipowners, of London, E.C.4. Mr. Palmer was previously assistant manager of the repair department of William Doxford & Sons, Limited, engineers and shipbuilders, of Sunderland.

Dr. DAVID CONRAD MILNER has been appointed editor of the new technical journal of Associated Electrical Industries, Limited, "AEI Engineering." The publication has replaced the journals formerly published by British Thomson-Houston, Limited, Metropolitan-Vickers, Limited, Siemens Edison Swan, Limited, and W. T. Henley's Telegraph Works Company, Limited. It will deal with the technical work and research of the company as a whole and will cover all its products.

Two New BISRA Appointments

SUCCESSOR to Dr. J. C. Hudson, who recently retired as head of corrosion research in the chemistry department of the British Iron and Steel Research Association, has been named as Mr. J. F. Stanners. From 1940 until 1945, after leaving Birkbeck College, London, with a B.Sc. degree in chemistry, Mr. Stanners was an analytical and research chemist with Thorium, Limited, Amersham (Bucks). He then joined the staff of the corrosion committee of the Iron and Steel Institute, transferring to BISRA when the committee was taken over by the association.

For the past eight years Mr. Stanners has acted as deputy to Dr. Hudson, representing BISRA on the technical panel of the Joint Committee for the Co-ordination of the Cathodic Protection of Buried Structures.

Mr. E. E. White has been appointed head of the BISRA corrosion advice bureau, of which he has been secretary since 1954. On leaving London University Mr. White became an assistant chemist with Carless Capel & Leonard, Limited, in 1935, transferring to John Ismay & Sons, Limited, two years later as a chemist. From 1940 until 1948 he was senior chemist and metallurgist of the Plessey Company, Limited.

After a period as full-time lecturer in applied chemistry and metallurgy at Northampton Polytechnic, Mr. White was appointed technical secretary of the BISRA corrosion committees and chemistry department, which post he still retains. Since 1959 Mr. White has been chairman of the education panel of the corrosion group of the Society of Chemical Industry.

Recent Wills

FOSTER, W. E., colliery engineer, of Stairfoot, Barnsley (Yorks) ... £6,532

WILSON, J. F., metal merchant of Hanbury Park, Worcester ... £16,753

BREAKWELL, JOSHUA, former undermanager at Walton Colliery (Yorks) ... £5,211

RUSSELL, E. R., for many years an ironfounder at Kidderminster (Worcs) ... £7,964

COCHRANE, S. J., a director of Cochrane & Sons, Limited shipbuilders, of Selby (Yorks) ... £92,449

BROWN, A. H., a director for 41 years of the Bedford engineering firm of Motor Rail, Limited ... £64,174

JONES, W. A., tinplate manufacturer of Newport (Mon) and formerly of Pontnewydd (Mon) ... £51,186

BEXON, R. A., a director of Keats & Bexon, Limited, makers of boot and shoe repairing machinery, of Stafford ... £67,425

GLYN, LORD, deputy chairman of J. Samuel White & Company, Limited, shipbuilders, of Cowes (Isle of Wight) ... £110,036

HEALEY, A. W., production manager of John Smith & Company (Derby), Limited, brassfounders and engineers ... £5,468

BARKER, THOMAS, secretary and a director of Sterling Metals, Limited, manufacturers of castings, etc., of Nuneaton ... £9,985

ROGERS, G. A., a director of E. E. Rogers (Stampings) (1958), Limited, stampers and piercers, of Birmingham ... £19,296

INGLEDON, A. K., tube manufacturer and formerly joint managing director of Lambert Bros. (Walsall), Limited ... £127,778

NEILD, ARTHUR, late of Manchester College of Technology and a member of the Manchester Association of Engineers ... £3,240

SMITHWAITE, W. E., former assistant secretary and cashier for 30 years of Doncaster Amalgamated Collieries, Limited ... £1,876

LE MARE, P. R., former chairman of Rickett, Cockerell & Company, Limited, coal distributors, etc., of London, E.C.3, and first vice-chairman of the Reitbene Coal Factors' and Wholesale Merchants' Association ... £224,861

Mining Qualifications Board Examinations

IN the examination for certificates of competency, held by the Mining Qualifications Board in May, 154 candidates were successful in securing first-class certificates. There were 107 successful for the undermanager's certificate and 60 qualified as surveyors of mines at the examinations held in May to July. At the May examination there were 29 successful candidates for electrical engineers, 25 for electricians Class I, 30 for mechanical engineers, and 16 for mechanics Class I.

Lists of successful candidates at the various examination centres are printed below.

First-class Certificates (Mine Managers)

GLASGOW.—H. Adamson; T. A. M. Brown; S. K. Chaudhuri; S. Gadhia; W. Gillespie; J. Grattan; W. Hamilton; W. Higgins; A. S. Jack; S. Jha.

S. Kennedy; T. M. Leitch; D. R. Mamidwar; C. McCaul; J. McGhee; W. R. Morrison; F. M. Murray; F. D. Scott; W. M. Wilson.

SUNDERLAND.—J. Crone; J. E. Duff; J. L. Elliott; H. W. Flannigan; A. V. Goodwin; B. T. Haswell; S. Jenkins; J. E. Kell; R. W. Murrie; H. Orr.

G. Richardson; G. A. Roper; A. Rutherford; F. L. Shields; J. B. Stewart; H. G. Watson.

DONCASTER.—F. Beaumont; G. C. Biggins; E. Bucklow; R. Butcher; W. Clegg; D. F. Coyle; G. Crompton; W. Crompton; L. Doody; R. Edwards; R. S. Ferguson; C. Freeman; G. F. Froggatt.

E. H. Gaunt; N. German; B. Gilligan; D. J. Graham; R. J. Gregory; D. D. Hackett; J. Hand; M. Z. Haque; C. A. Hayward; R. Henshaw; A. B. Hepplewhite; I. C. Jeffrey; A. J. Lee.

T. Malley; A. Merrington; F. Middleton; T. F. Mottram; I. R. Muirhead; G. Nicholson; B. Partridge; J. H. Pashley; J. J. Phillips; R. Prince; J. I. C. Reid; J. Saunders; R. Smith; P. Speight; I. Storey; R. Stubbs; D. Townend; B. Vaughan; D. Wall; M. Whitlam; R. L. Wilson; G. I. Windfield; E. Yates.

WIGAN.—A. E. Alexander; J. Bootle; T. Chapman; T. W. Fleming; W. Foster; J. H. Glew; G. St. J. L. Goddard; M. Goldsby; W. A. Griffiths; L. Halliday; F. R. Hampson; F. Holden; R. P. Hughes; A. Ingham; T. J. Jones; B. H. Kitchen.

J. Lavin; H. Lister; E. Marsh; W. H. Miller; G. Newton; P. R. Prasad; R. Stephenson; W. H. Tattersall; J. Thomas; S. Williams.

CARDIFF.—R. J. Collins; G. G. Daniel; H. J. Evans; H. W. Evans; M. W. Gay; W. J. G. Golding; C. G. Hapgood; L. G. Hardwick; G. J. Hartshorn; D. Hinchliff.

D. M. Jack; T. T. Kinsey; W. J. P. Leigh; D. B. L. Lewis; W. A. Lewis; V. Rees; D. I. Roberts; A. W. Standen; J. Taylor.

STOKE-ON-TRENT.—E. Faker; J. B. Dale; D. J. Dodsworth; R. V. Downes; K. B. Harris; J. W. Hayhow; D. J. Hodges; R. C. Hollins; B. G. S. Iygengar; H. V. Jones; T. P. Leader; G. Lewis; B. Lovatt.

T. H. F. Malkin; P. N. McDermott; D. B. Owen; A. Price; J. C. Reynolds; C. E. Rhodes; T. D. Richardson; G. C. Rowlands; M. R. Stokes; R. Wallbank; G. M. Whitehurst; R. E. Winfield.

Second-class Certificates (Undermanagers)

GLASGOW.—J. Bonnard; S. T. Clark; W. Fairman; D. A. Fyfe; J. F. G. Hall; A. McHale; D. M. McKillop; J. R. McLellan; J. K. F. McTear; J. Mitchell; D. Nisbet; J. Park; D. C. Shannon; A. H. Warnock.

SUNDERLAND.—F. Barker; W. E. S. Blenkinsop; R. S. Bunker; J. H. Cairns; J. H. Carr; R. W. Carr; R. Cowan; T. Craggs; G. Dean; H. Dobson; J. Eilbeck; T. A. English; E. P. Farrage; H. D. Harrison; P. Howie; W. M. Lamb; M. McCullough; B. R. McGlen; L. Patterson; G. W. Sanders; W. J. Smith; T. C. Thornton; D. Watson; D. Watson; J. D. Winter; H. Young.

DONCASTER.—T. Alford; D. Amatt; C. Ashworth; H. B. Bennett; G. R. Booth; E. Briggs; P. Britton; G. Coupe; R. T. Cunningham; W. M. Cushing; W. A. Dobson; H. Fletcher; J. A. Gwatkin; F. Hassall; T. W. Haynes; E. G. Hollewell; E. Holmes; D. Hopes; F. J. Hutchings; F. Jagger.

W. Myers; C. R. Noble; D. Oliver; B. F. Pinder; W. Reeve; G. A. Rich; K. R. Rigley; W. H. Robinson; P. Savage; H. E. Severn; W. Simpson; J. E. Simons; P. Slater; D. Stephenson; A. J. Vardy; M. I. Walker; P. H. Ward; C. Werle; T. E. Wheatley; J. H. White; H. Wood; R. Woolley.

WIGAN.—W. B. Limm; D. A. Smith; P. M. Smullen; A. Whittaker; W. Wilcock.

CARDIFF.—H. Esau; J. A. Evans; M. L. Rees; G. V. Roach; D. R. Thomas; J. J. W. Velthuis; A. D. Waters.

STOKE-ON-TRENT.—R. Bown; H. R. Bradbury; J. Cockburn; H. Ellis; P. S. Goodfellow; J. W. Hall; J. M. Hill; J. G. Jones; J. Moreland; F. W. Owens; D. Turner; R. P. White; L. Woodward.

Surveyors of Mines

GLASGOW.—H. M. Black; R. B. Blair; M. J. Borrer; G. F. W. Bruce; J. B. Dempsie; J. Dickson; J. H. Findlay; J. Henderson; R. K. M. Laidlaw; K. G. McClelland; R. C. M. Rankin; D. T. Stewart; D. Wilson.

SUNDERLAND.—T. Anderson; S. Cape; W. Dawson; G. L. Green; W. Hollands; A. Jordan; E. H. Lee; G. R. Lewis; J. W. McDermott; J. H. Nixon; A. Oliver; K. Robertson; A. Smith; J. R. Sproul; A. Stokoe; R. Tateson; J. R. Vaux.

DONCASTER.—G. Barnes; J. N. Blackburn; D. P. S. Booth; B. W. Broadhead; M. Brown; J. R. Burchill; A. D. Cox; G. Duker; T. C. Hartshorn; D. A. Pink; F. E. Smith; P. E. Turner; J. Walshaw; N. J. W. Widdowson; K. A. Yeadon.

WIGAN.—B. J. Cale; A. W. Hewitson; A. Holdsworth.

CARDIFF.—K. L. Bolton; D. E. Davies; P. W. G. Hodges; W. L. Jones; P. Sandey.

STOKE-ON-TRENT.—P. G. Court; G. Dennis; G. Finney; M. B. Hayes; B. Mason; C. Mason; A. B. Read.

Electrical Engineers

SUNDERLAND.—A. Girven; H. H. Green; M. Simpson; J. E. Spencer.

DONCASTER.—E. Barber; C. Bird; J. Bissett; G. Burke; E. Cartwright; H. Cullumbine; W. F. Evans; R. T. Hewitt; A. L. Waters; G. Westwood.

WIGAN.—H. Forshaw; R. C. Hesketh; J. V. Smith.

CARDIFF.—E. R. Beynon; D. J. Dyer; A. J. Furber; M. Horne; M. E. Hougham; H. D. Owen; C. H. Summers.

STOKE ON-TRENT.—K. J. Edwards; H. A. Partridge; M. B. Smith; L. Taylor; A. Williams.

Electricians Class I

GLASGOW.—A. Docherty; R. D. McCormick.

SUNDERLAND.—J. G. Smith.

DONCASTER.—R. V. Bishop; D. E. Brook; F. T. Carline; J. W. Doxey; T. Gouldthorp; R. Hall; R. H. Harvy; R. Hurdiss; P. L. Marshall; M. Maude; M. Rear; I. J. Sampson; R. C. D. Vaudin; J. Wilson.

WIGAN.—B. Farrar; J. Parkinson; R. G. Rothwell.

CARDIFF.—F. I. Barkus; K. L. Evans; P. F. Jones.

STOKE-ON-TRENT.—B. Allen; R. Steel.

Mechanical Engineers

GLASGOW.—J. J. Haldane; J. McIntosh; V. N. Waters.

SUNDERLAND.—A. D. Best; J. N. Glendenning; A. Satterley; G. Thorogood; C. S. Wade; R. Walton.

DONCASTER.—R. C. Briggs; H. G. Brown; R. Buckley; G. Carter; M. Gildea; F. B. Hindley; C. R. Hutton; K. Mitchell; C. I. Smart; E. Swift; K. Taylor; A. E. Walker; W. Walker; H. Wildsmith.

WIGAN.—F. Robinson.

CARDIFF.—D. M. James.

STOKE ON-TRENT.—P. Hodgkinson; G. V. Lowndes; D. H. Popman; A. Sulley; A. R. Yates.

Mechanics Class I

GLASGOW.—R. Brown; H. Kane.

SUNDERLAND.—D. Hope; J. M. McCracken; A. Robinson; T. L. Scott; R. Thompson; H. Vickers.

DONCASTER.—T. V. Craig; S. Greatbatch.

WIGAN.—D. Green; A. Isaac; D. Murphy; J. L. Yeoman.

CARDIFF.—G. J. G. Gregory.

STOKE-ON-TRENT.—L. Weston.

THE British Insulated Callender's Cables, Limited, group has supplied and installed 2.6 miles of 33 kV, 3-core solid H-type power cable, armoured and PVC sheathed overall, and 3½ miles of 7-pair underground pilot cable at Abadan in Iran. The cable route runs from the oil consortium's power station in Abadan to the start of the 132 kV overhead line from Abadan to Ahwaz. The installation, valued at £82,500, is a contribution to the Iranian government's plan to develop Khuzestan Province, an agricultural region adjacent to the Abadan oil fields and refinery on the Persian Gulf.

Board Changes

GKN Creates Two New Executive Posts

THE board of GUEST, KEEN & NETTLEFOLDS, LIMITED, announces that, with the object of providing more direct and personal assistance to the group chairman, the group secretary, Mr. W. A. Nicol, and the group chief accountant, Mr. W. W. Fea, are relinquishing these offices and have been appointed administrative director and financial director respectively.

Mr. J. F. Howard, at present assistant secretary, has been appointed group secretary and Mr. F. C. Rowbottom, at present assistant chief accountant, has been appointed group chief accountant.

WILLIAM BLYTHE & COMPANY, LIMITED—Mr. F. Parkinson has joined the board.

MASSEY-FERGUSON, LIMITED—Mr. C. F. Herrmeyer and Mr. R. W. Main have resigned from the board.

DARTMOUTH AUTO CASTINGS, LIMITED—Mr. J. H. D. Pearce, formerly sales manager, has joined the board as sales director.

MOUNTSTUART DRY DOCKS, LIMITED—Mr. T. E. Morel has resigned from the board and Sir C. G. Alexander has been appointed a director.

DEWRANCE & COMPANY, LIMITED—Mr. M. J. Verey has resigned from the board and Sir Donald Perrott has been appointed a director and deputy chairman.

SIR LINDSAY PARKINSON & COMPANY, LIMITED—Mr. G. W. Parkinson has been appointed a full director and Mr. J. H. Bryant has been appointed a specialist director.

RICHARD THOMAS & BALDWINS (SALES), LIMITED—Mr. P. M. J. Boulasse, Mr. S. C. Burgess, Mr. G. Durward, and Mr. L. G. Stock have been appointed directors.

HADFIELDS, LIMITED—Mr. Denis R. Ward, assistant secretary of the company and secretary of several of the subsidiaries, and Mr. Arthur W. Gurney, chief cost accountant, have been made local directors.

ANDERSON'S RUBBER COMPANY, LIMITED—Col. L. A. Davies has been appointed chairman in succession to Mr. S. H. Elkington, who has resigned from the board. Mr. V. L. Young has also relinquished his directorship.

GUEST KEEN IRON & STEEL COMPANY, LIMITED—Mr. C. F. Pagnamenta, secretary of the company has been elected a director. He joined the company in October, 1957, as chief accountant and became secretary in August, 1959.

INTERNATIONAL NICKEL COMPANY OF CANADA, LIMITED—Mr. W. K. Whiteford has been elected a director until the annual meeting in 1962. Mr. L. S. Rockefeller has resigned from the board and has been appointed a member of the advisory committee.

UNITED GAS INDUSTRIES, LIMITED—Mr. D. M. Robinson has been appointed managing director and director responsible for group production. Mr. N. L. Smith will continue as deputy chairman responsible for group sales and Sir Donald Perrott has joined the board as a part-time director.

W. A. TYZACK & COMPANY, LIMITED—Mr. Andrew Jollie has joined the board. He will assist in the overall development of the company's two Sheffield factories. Mr. Jollie recently resigned as a director and general manager of Steel, Peech & Tozer branch of the United Steel Companies, Limited.

New £14,000,000 Pit Opens Next Month

COMMISSIONING of a big new anthracite colliery, Cynheidre, near Llanelly (Carm), which has cost nearly £14,000,000 to build, will be carried out by Sir James Bowman, chairman of the National Coal Board, on September 8. It is expected to be his last official visit to the South Wales coalfield before he retires at the end of the year.

One of the world's most modern pits, Cynheidre breaks from tradition in that the familiar pithead winding gear is not to be seen. New winding mechanism for the pit cages is push-button operated and completely enclosed. Anthracite began to be mined at Cynheidre only recently. Output is expected to reach 700 tons a day by the end of this year, 1,910 tons by the end of 1962, and 2,228 tons daily by the middle of 1963. The first stage of development will then be complete, with the colliery employing about 1,800 miners.

Some of the old neighbouring anthracite collieries in West Wales are expected to close and the miners to transfer to Cynheidre. Abernant—its twin pit in the Swansea Valley—is expected to be officially commissioned next spring. Sir James visited South Wales recently to open a smaller anthracite colliery—Brynlliw, near Swansea.

Striking Deputies Halt Largest Pit in Lancashire

WORK at Mosley Common Colliery, near Leigh, Lancashire's largest pit, was brought to a standstill last Friday when 150 overmen and deputies refused to go below. They were protesting against the reinstatement of a ripper who was concerned in a case of alleged assault on an overman. Nearly 3,000 men became idle.

Leigh magistrates had dismissed the case in which the ripper, Mr. J. F. Gallagher (38), was accused of assault on an overman, Mr. Frank Jones (48), causing him bodily harm. The ripper had been temporarily suspended from the pit, but after the hearing he was told he could resume work. When the overmen and deputies learned of the decision they went on a token strike for three shifts as a protest.

A police inspector alleged in court that the incident arose when Mr. Jones ordered four men, including Mr. Gallagher, to go back and complete their shift after acting as stretcher bearers for an accident case. Mr. Jones claimed he was injured so much he was off duty for two weeks. Mr. Gallagher denied the charge, saying he and his brother found the overman lying in the pit with a cut eye after falling over a spade.

A local Coal Board spokesman said the matter did not directly concern the board, and would have to be settled between the NUM and the deputies' union.

ABOUT 50,000 general production workers at the factories of Imperial Chemical Industries, Limited, have been awarded wage increases of up to 7s. 10½d., a week. The settlement, covering about 100 factories, is backdated to July 14. With the standard working week of 42 hours, introduced by ICI earlier this year, the settlement will cost the company about £900,000 a year.

Sharp Rise in Scottish Coal Exports

SCOTTISH coal exports in the first half of the year recovered well from the slump level in 1959, the total for the first 30 weeks showing a rise of 70 per cent. Despatches to Denmark increased by 50 per cent. to keep that country easily at the head of the list of importing nations. The additional business consisted mainly of duff, which was none the less welcome in helping to confine the surplus in the division to reasonable dimensions.

One of the most striking changes occurred in the Dutch trade which increased tenfold. Business fell away sharply when quotas were cut last year to conform with ECSC policy, but the low volatile duff in which Holland has been interested for several years retained its attraction and the trade was quickly restored to its former volume when restrictions were eased towards the end of last year.

Exporters were particularly gratified with an expansion in business with Sweden, formerly one of Scotland's best customers. Orders were entirely for nuts. Norway arranged regular shipments of pearls, which are scheduled to continue until December.

There are hopes that the total dispatches of nuts to Greenland will exceed last year's figure before the season ends. A doubling of duff shipments to Germany failed to offset a slump in the trade with France.

Coal Board to Extend Use of Data Processing

BECAUSE of the substantial administrative economies and quicker preparation of costs and statistics, the West Midlands Division of the National Coal Board is to extend its data processing organization. There are at present two installations, one dealing with 23,000 piecework and daywork wages, and the other with the preparation of invoices for sales of coal to other than the retail trade.

Data processing is to be extended to other accounting procedures, and a specially designed building at Cannock is to be put up for centralizing all such activities. It will employ about 180 people and should be ready for occupation next June.

Over the next two or three years wages, salaries, and sales—together with associated costs and statistics—will be processed for all areas of the Division, and after that stores and other accounting procedures will be added.

FALLING PITPROP KILLED MINER

VERDICT of Accidental Death was recorded on Mr. Trevor Jones (24), a miner, who was killed at Llanhilleth Colliery (Mon) after being struck by a falling pitprop. The coroner, Mr. D. J. Treasure, stated that although no one had seen the accident happen, it probably occurred when falling rubble, discharged when a pitprop was removed, struck another prop causing it to fall and strike Mr. Jones.

A deputy at the colliery, Mr. Arthur Leslie Watts, said he had examined the face before the accident and he was satisfied that everything was normal.

ASSOCIATE COMPANY of Opperman Gears, Limited—Limitorque Valve Controls, Limited—which was formed in 1959—is to exhibit at the British Trade Fair in Moscow in 1961.

Rise Forecast in ECSC Coal Consumption

IN its estimates for the third quarter of this year, the High Authority of the European Coal and Steel Community sees a further slight improvement in the coal market within the ECSC block. Coal consumption is expected to be some 2 per cent. higher than in the third quarter of last year. Coal supplies to ECSC coking plants should be some 2,000,000 metric tons—or 8 per cent.—above those recorded in the 1959 third quarter, while consumption by power stations is expected to be 7 per cent. higher, thus compensating for the lower consumption by railways and gasworks.

Coal supplies to industry, excluding the iron and steel trade, should remain constant while household supplies are expected to fall. All in all, a hard coal demand of 59,700,000 tons is estimated for the third 1960 quarter.

Coal exports to countries outside the ECSC are expected to rise by 7 per cent., partly due to the resumption of exports to Austria. Coal imports from outside the ECSC are expected to be up by about 300,000 tons to a new figure of 4,400,000 tons, due to the purchase of United States coal by Italy. Hard coal output within the ECSC is estimated at 55,500,000 tons, compared with 55,900,000 tons for the third 1959 quarter, though loss of production due to cut shifts will be only 1,300,000 tons (against 3,200,000 tons). It is expected that by the end of September, ECSC coal stocks will be down to 31,100,000 tons, representing a fall of 400,000 tons over the three-month period.

Hard coal output in Germany last month was slightly higher, at 11,510,000 tons, than in June (11,260,000 tons) due to a greater number of working days; but pithead stocks continued to fall. Since the beginning of the year to August 2, stocks have fallen in Federal Germany, including the Saar, by 2,870,000 tons to a present level of 15,010,000 tons. This figure comprises 9,650,000 (11,080,000) tons of hard coal and 5,460,000 (6,800,000) tons of coke.

With the continued development of the ferrous metal industry, it is estimated that stocks will fall by a further 2,500,000 to 3,000,000 tons by the end of the year in Germany to a new level of 12,000,000 to 12,500,000 tons. The country's hard coal productivity per manshift has risen to 2,077 kg.

The Belgian Government has given details of a fund it is to form to aid its coal-mining industry. This will receive its revenue from a tax on fuel oil, amounting to 60 Belgian francs (8s. 6d.) per ton for the first year of its imposition, 40 B.fcs. (5s. 9d.) per ton for the second year, and 20 B.fcs. (2s. 10½d.) per ton for the third year. By 1965, says the Government, the coal mines should be in a competitive position again.

Six Bells Colliery Explosion Inquiry

PUBLIC inquiry into the explosion which occurred at Six Bells Colliery on June 28, will open in No. 2 Court, Civic Centre, Clytha Park Road, Newport (Mon), on September 19.

The inquiry will be conducted by Mr. T. A. Rogers, H.M. Chief Inspector of Mines and Quarries, and his report will be published in due course, the Ministry of Power states.

The fund set up for dependants of those killed in the explosion approached £70,000 on Wednesday.

Law Cases

Widow Loses Claim to Vote in Carron Company

ACTION brought against the Carron Company, iron-founders and engineers, of Carron, Falkirk, by an Edinburgh woman who claimed that she was entitled to vote in the direction and management of the company's affairs, was dismissed in the Court of Session by Lord Walker. The action was by Mrs. Dorothy Barron Pentland Forwell or Brown, widow of Mr. Charles Marshall Brown, who at his death in 1948 was secretary of the company and a voting partner. In the terms of his will, Mrs. Brown inherited his entire estate, including 17 shares each valued at £250 in Carron Company, being the largest holding held by any one shareholder in the company.

Lord Walker, in his judgment, said the company was incorporated by Royal Charter in 1773 and on December 21, 1959, it presented a petition to the Crown for a supplementary Charter. Mrs. Brown had objected to certain proceedings in the company's general meetings authorizing the presentation of the petition, on the ground, *inter alia*, that her consent had not been obtained.

On October 20, 1949, on the narrative that she had the life rent of the 17 shares, she executed a proxy in favour of Dr. Henry Hilton Brown, who was himself a shareholder in the company with voting rights. Both the will and the proxy were intimated to the company. Since August, 1951, Mrs. Brown had, as an individual, been the registered owner of the 17 shares. Her primary conclusion was for declarator that she "is a partner—entitled to vote in the direction and management of the defenders' affairs."

But, said Lord Walker, her single plea-in-law in supports of it embodied no legal proposition whereby that conclusion could flow from the facts averred. Moreover the articles of her condescendence contained matter which was in part argumentative and in part hypothetical, stated in such a confused form that his lordship could not discover from the record what it was in the company's constitution that Mrs. Brown founded on, in relation to her shareholding, as giving her a right to vote either personally or by proxy.

"I have much sympathy, therefore, with the defenders' contention that the record is so radically irrelevant and defective as to lead to instant dismissal of the action."

ACTION AGAINST WORKER FAILS

CLAIM for damages by Harts Hill Iron Company, Limited, Brierley Hill (Staffs) against an employee, Mr. James Cox, was dismissed with costs at Brierley Hill Magistrates' Court. The firm claimed that it had sustained a loss when Mr. Cox was absent from work on three days in June, and asked for £10 damages.

Mr. W. E. Taylor, managing director, said Mr. Cox was a key man in the rolling mill, earning an average of £14 a week. He was employed on the night shift on the dates in question, and on one occasion when he was absent the whole shift had to be sent home. It was understood that workers should notify the firm when they could not get to work, said Mr. Taylor, who agreed however that there were no written instructions on the matter.

Mr. Cox said that he was taken ill a few hours before he was due to go to work, and had no chance to notify the firm. An employee at the firm had visited him, and he thought she would notify the office that he was ill.

MINE REGULATIONS BREACHED

BREACH of mine regulations at Brynlliw Colliery (Glam) led to the death of one workman and injury to another, Gowerton Magistrates' Court was told. David Thomas Morris and William Glyn Davies, both colliers, pleaded Guilty to allowing two workmen to travel to the surface in a lift cage into which a tram crashed after falling down the shaft. They were each fined £5 with £3 3s. costs.

Mr. Rosser John, for the National Coal Board, said that the tram crashed into the cage because an automatic stopping device which would have prevented the tram from entering the shaft had not been set.

Mr. David Neville Morgan Davies, the colliery manager, stated that the gates to the shaft had been installed only three days before the accident and the closing gear had not been fitted.

MI Chairman on Group's "Momentous Year"

RECALLING that at the time of the last annual meeting the group was made up of 16 active subsidiaries with a total of 6,000 employees, Sir Charles Westlake, chairman of Metal Industries, Limited, states that today the group has 38 subsidiaries and associated companies at home and oversea, and the number of employees exceeds 12,000. "The market value of our issued share capital has increased from about £10,000,000 to a figure in excess of £26,000,000. The number of our ordinary stockholders has risen from a little over 7,000 a year ago to approaching 10,000."

Sir Charles says the acquisition of the Lancashire Dynamo group and the consequent doubling in size of the Metal Industries group made 1959-60 a momentous year. Integration of the two groups would take some time, but the problems were being resolutely tackled.

A substantial programme of capital expenditure is now under way, not only in replacements to increase efficiency in production, but also in the expansion of activities, particularly in newer fields of development. Apart from progress in the electrical and hydraulic fields, the general engineering, metal processing and shipbreaking activities "continue to give us the useful financial support we have come to expect of them."

Simon-Carves and Lodge-Cottrell Activities Link

ELECTRICAL precipitator division of Simon-Carves, Limited, is being transferred to Birmingham, and after September 1 its address will be: Simon-Carves, Limited, George Street Parade, Birmingham 3.

The move is being undertaken to concentrate in one place activities of Simon Engineering, Limited, in precipitation work. Lodge-Cottrell, Limited, already operates from this Birmingham address, and the integration and closer co-operation is hoped to benefit clients.

Simon-Carves and Lodge-Cottrell will offer the same range of designs and services as in the past.

NEWS IN BRIEF

VOEST, Austria's chief iron and steel producer, is to introduce at the end of the year a fifth blast furnace at its Linz plant.

ADDRESS of the Reading branch of British Insulated Callender's Cables, Limited, is now Katesgrove Lane, Reading (telephone: Reading 55074, as before).

IT HAS BEEN announced that Steel Radiators, Limited, Southall (Middx) is to open a branch factory on the outskirts of Dalbeattie (Kirkcudbrightshire).

METAL WINDOW DIVISION of John Williams & Sons (Cardiff), Limited, has transferred to new premises at Curran Road, Cardiff (telephone: Cardiff 37131).

NEW 290 ft. dry dock designed for the repair of coasters and colliers was opened at Sunderland on Monday by Austin & Pickersgill, Limited. It replaces a 90-year-old wooden dry dock which was closed a year ago.

APPROVAL HAS BEEN GIVEN for the erection of a 10,000 sq. ft. Government factory at Llwynypia (Glam), to be used as a branch works of John Morgan (Meca), Limited, manufacturers of metal pressings, of Birmingham.

TYNE MARINE FIRM of G. Lamb & Son, chain and anchor merchants, of South Shields, is closing down at the end of next month after being in existence since 1798, because of the ill health of Mr. Alan Merriman, the proprietor.

LONDON OFFICE has been opened by Strachan & Henshaw, Limited, mechanical handling plant engineers, of Bristol, at room 351, Victoria House, Southampton Row, London, W.C.1 (telephone: CHAncery 2250), under the management of Mr. P. A. Denning.

PRODUCTION of mining equipment at the works of the Rhymney Engineering Company, Limited, Rhymney (Mon) was stopped on Monday when about 250 men walked out after a disagreement with the management. The men returned to work on Tuesday night, a union official stating the dispute had been settled satisfactorily.

STEWARTS AND LLOYDS, LIMITED, has decided to participate in the new graduated state pension scheme on behalf of the 41,000 employees in the group. It is not proposed to make any change in the company's privately operated pension funds so long as the contributions to the state scheme remain "as at present contemplated."

IMPORTS of iron and manganese ores at Middlesbrough last month totalled 405,386 tons, compared with 285,859 tons in the corresponding period of 1959. At West Hartlepool 86,600 (29,150) tons were unloaded. Unless labour troubles delay ore ships it is forecast that arrivals for this month at Middlebrough will exceed 500,000 tons.

SURVEY published by the Industrial Welfare Society shows that considerably less than half the people empoyed in industry eat in their firms' canteens. The overall average is 34 per cent. In London 41 per cent. of workers take canteen meals, but only 28 per cent. do so in the Midlands.

NEW INVESTMENT programme for the next five years is announced by the German steelmaking concern Phoenix-Rheinrohr, of Düsseldorf. Two new gas furnaces will be built with a 9-m. base measurement, and a fifth convertor is to be erected. The Thyssen works is to be enlarged to receive a throughput of 50,000 tons of sheet steel monthly.

LAST YEAR 34,093 metric tons of pig-iron was imported into Switzerland compared with 30,947 tons in 1958. West Germany continued as Switzerland's main pig-iron supplier, with 57 per cent. of the market. Coal imports into Switzerland in 1959 amounted to 2,390,000 (2,480,000) tons. Main supplier was again West Germany.

ACCIDENT RATE at the Redbourn steelworks, Scunthorpe, of Richard Thomas & Baldwins, Limited, is only about half that of a year ago. Only two accidents were recorded in June. In the first quarter of the year the Redbourne works' low accident rate gained third place in the British Iron and Steel Federation list.

PATENTS on the process and apparatus for making synthetic diamonds have been granted to General Electric of the US. In 1955 the company announced that it had succeeded in producing man-made diamonds. The patents, issued by the US Patent Office, cover the "basic" high-pressure equipment used as well as later improvements on such equipment.

FELLOWSHIPS for postgraduate research training have been awarded by the British Oxygen Company, Limited, to Mr. P. C. Bonsall, of Birmingham University, for research training at the Royal Technical College, Salford (Lancs), and to Mr. J. W. May, of Oxford University, for research training in the Inorganic Chemistry Laboratory, Oxford University.

MASSEY-FERGUSON, LIMITED, Toronto, has put into operation a 9,000-mile, automatic, internal communications system which links its 44 offices and 36 cities across Canada and the US with a private line teletypewriter network. The control centre for the system, capable of handling 100,000 words daily at the rate of 75 words per minute, is located in the company's Detroit offices.

GRANT of £2,150 per annum for three years to Southampton University to encourage research in chemistry is being made by the chemicals division of Union Carbide, Limited, which has a major petrochemicals plant at Hythe (Hants). The grant will provide for a research studentship and a research fellowship in synthetic organic chemicals in the University's department of chemistry.

AWARDED THE CONTRACT for the exploratory work connected with the second phase of the Kariba power scheme, the Rhodesian company of the Cementation Company, Limited, group is now engaged in driving a complex of tunnels through the hill on the north bank for testing the rock to be hollowed for the second power house. The preliminary work is expected to be completed early in 1961.

THE jointly-owned Stone-Manganese Marine, Limited, which was formed in April by the Manganese Bronze & Brass Company, Limited, and Stone-Platt Industries, Limited, has started trading operations. It is responsible for the oversea sales of the marine products of the Manganese Bronze & Brass Company, J. Stone & Company (Propellers), Limited, Bull's Metal & Marine, Limited, and Steven & Struthers, Limited.

HOME SALES of farm tractors and machinery were 14 per cent. lower in the first half of this year compared with the same period last year, the sales of combine harvesters being little more than half of last year's total. The Agricultural Engineers' Association reports that there was an overall gain of more than a third in exports, with good increases in sales to Europe in spite of growing German competition.

EXPERIMENTAL mine car of aluminium is undergoing field tests in a West Virginia coal mine. The car weighs only about half as much as a conventional

steel car of the same size, which means it can be re-railed without difficulty. The 6,840 lb. car, with a capacity of 18 tons of coal, resists the sulphur in the mines and has been treated to prevent galvanic corrosion where the aluminium body touches the steel undercarriage.

PRODUCTION CAPACITY for sodium silicofluoride has been increased by Imperial Chemical Industries, Limited, by over 50 per cent. with the commissioning of a new plant at Billingham (Co. Durham). Sodium silicofluoride is used largely in the glass, vitreous enamelling, light alloy, and rubber trades. It has been scarce in the UK for a number of years, but ICI is confident that it can now produce enough to satisfy all the home demand.

THE COAL EXCHANGE in Lower Thames Street in the City of London—one of the City's most remarkable 19th-century buildings—would appear to be doomed by proposed road widening. The Victorian Society states in its annual report: "That it will be retained unaltered on its present site there is little hope, though enough to make it still worth fighting for." The Exchange, designed by J. B. Bunning and opened by Prince Albert in 1894, is now unused.

FIRST STAGES of a project designed to investigate the mineral wealth of Weardale (Co. Durham), which is being directed by Prof. K. C. Dunham, head of Durham University Geology departments, have started at North Rookhope where deep-boring equipment is being delivered to a site occupied by the Weardale Lead Company, Limited. The boring, which will be to a depth of 5,000 ft., aims to discover sources of lead, zinc, fluorine, and barium in the Pennines.

OVER 93,000 employees of Imperial Chemical Industries, Limited, have qualified for bonus in respect of 1959 under the company's profit sharing scheme. The bonus amounts to £5,523,000 (£4,131,000), after personal income tax, giving an average of £59 4s. 10d. (£44 6s. 7d.) per employee. The trustees of the scheme are to acquire on behalf of the employees £1,825,000 ICI ordinary stock to be issued by the company for this purpose out of its unissued capital. When an employee has 40 or more units to his credit the stock is registered in his name.

"Delaying Tactics" By Engineering Employers Alleged

AFTER an executive meeting of the Confederation of Shipbuilding and Engineering Unions in York last week, Mr. James Matthews, president of the confederation, said the executive was very concerned about the employers' "delaying tactics" on the unions' application for substantial wage increases for 3,000,000 workers. He complained that the employers had been unable yet to offer a date for discussions.

The confederation could not accept the employers' excuse that they found it difficult to arrange a meeting during the holiday period, and the executive had decided to write a further letter to the employers.

The confederation submitted its annual claim seven weeks ago—much earlier than usual—in the hope that negotiations could start this month instead of in the autumn, the traditional date for beginning the wage round in engineering and shipbuilding.

The British Employers' Confederation, discussing unofficial strikes in the current edition of its official Bulletin, has warned its members that they should "be wary of building up the dissidents to the detriment of the unions."

£50,000,000 Steelworks Starts Production

NEW £50,000,000 works of the South Durham Steel & Iron Company, Limited, at West Hartlepool, began production on Tuesday with the tapping of the first 360-ton open-hearth furnace. The new plant will mean an extra 2,000 jobs for an unemployment black spot. By the end of September it will be turning out 20,000 tons of heavy steel plate a week, rising to 30,000 tons next year.

The plant has been under construction since October, 1957, and is claimed to be one of the finest heavy plate mills in the world. Four more furnaces will be ready by next July, and by mid-1961 the combined output from the company's two works at West Hartlepool will be over 1,000,000 tons a year.

There was a mishap during the commissioning of the first furnace. Due to a failure in the hydraulic system, the furnace, pouring out molten steel, could not be restored to its upright position. As a result, when an overhead crane moved away the 200-ton ladle, molten slag went on cascading to the ground 20 ft. below for over half-an-hour. Part of a railway track running through the melting shop was destroyed. When the last of the slag drained out workmen brought up a wagon-load of sand to smother the flames.

Mr. T. J. Williams, a director and group general manager, said there was no serious damage and no steel was lost. The fault could soon be put right, and production would not be affected.

Machine-tool Industry's Need for Stability

FULL employment, substantially reduced night shift working, a shorter working week, wage increases, and general inflationary pressures have the effect of increasing demand for high-production, fully-automated machine tools. Lord Aberconway, chairman of Wickman, Limited, the Coventry machine-tool manufacturers in his annual review goes on to say that the extent to which the group will be able to take advantage of these circumstances will depend on its ability to obtain additional craftsmen and technicians.

He points out that the industry is one of "feast and famine" and that skilled craftsmen taken on during the industry's "ups" are sometimes made redundant during its "downs" with resulting bad labour relations. If the machine tool industry is to achieve stability, hold the necessary craftsmen and technicians, and maintain and improve its service to the motor-vehicle industry, Lord Aberconway believes that "it is essential to achieve closer co-operation between the two industries in forecasting the need for new capacity before it arises."

WORK WILL START next month on the construction in Sunderland of a factory for Hepworth & Grandage, Limited, piston and piston ring manufacturers, of Bradford, a member of the Associated Engineering Holdings, Limited, group. The factory will produce components for the motor car industry, and will eventually employ 1,000 men. It will be the first major new industry to be established for nine years in Sunderland, which has the highest unemployment rate in the North East of England (5.2 per cent.).

The Scrap Markets

Widespread Demand Continues

MERCHANTS are finding no difficulty in disposing of all arisings of heavy steel and basic scrap to the consuming works and, were it available, could handle a considerably greater quantity. As it is, in some areas, supplies are still boosted by imports, a large shipment from North America having recently been offloaded in the north-east.

Scotland—The market has now returned to normal trading and merchants can place easily their holdings of heavy steel and basic scrap. The steelmakers continue to stress the importance of increasing deliveries and merchants, on their part, are doing everything possible to increase supplies.

Production of heavy steel turnings remains at about recent levels and provided the material is of good quality and free from bushy turnings, it is readily accepted by the consuming works. The output of cast-iron borings remains fairly steady and regular consignments are finding their way to the blast furnaces.

North-east Coast—Coastwise shipments from south country ports are helping, with oversea imports, to relieve the pressure locally for steelmaking scrap. Merchants are being pressed for maximum deliveries of the better grades of heavy melting scrap and works orders for short heavy steel and machinery scrap are also plentiful.

Large tonnages of baled materials are passing forward to the blast furnaces, but although local consumption of cast-iron scrap is on a limited scale, outlets in other parts of the country are enabling dealers to clear part of their stocks.

South Wales—Heavy and better scrap continues to be the main requirement of the steelmakers and ironfounders. Merchants are holding little or no stocks, in fact they are ever on the lookout for sources of supply. Parcels, large and small, are brought in whenever possible.

Stocks of steel and iron scrap on the ground at steelworks and ironfoundries are, in most cases, minute. The market generally is very active.

Union Tries to Save Parkfield Foundry

EFFORTS are being made by the Confederation of Shipbuilding and Engineering Unions to prevent the closure of the Parkfield foundry of Ashmore, Benson, Pease & Company, Limited, at Stockton-on-Tees. The company has already announced that the foundry must close at the end of the year since it is no longer economical and since the company's business in general castings does not justify the building of a new foundry.

The union's view of the situation conforms with that of the company, but confederation officials have decided to appeal to the North Regional Board for Industry for assistance to keep the foundry in operation.

BUTYL RUBBER PLANT, costing £4,300,000, is to be built by the Esso Petroleum Company, Limited, at its Fawley (Hants) refinery. It will be the first of its kind in the UK and the fifth in the world.

Allied Ironfounders and Bilston Foundries

DIRECTORS of Allied Ironfounders, Limited, in their formal offer for the £420,000 one-class ordinary capital of Bilston Foundries, Limited (Staffs), state that the consolidated profits for the current financial year to date are in excess of those for the corresponding period of last year and foreshadow maintenance of a 20 per cent. dividend on the increased capital.

Bilston directors are accepting the offer of two Allied ordinary £1 shares for every 15 Bilston 2s. ordinary (as stated on July 29) in respect of their own holding and recommend other holders to do likewise.

Trading profits of Bilston, now announced, show a fall from £263,164 to £118,675 in 1959-60, and after tax there remains a net loss of £1,921 compared with a previous profit of £107,692. Mr. T. I. Hobart, chairman, states that the board considers the present setback a temporary one. It has confidence in the future, and long-term prospects of Allied are regarded even more favourably in view of its widely spread activities.

Mechanical Handling Exhibition Arranged for 1962

NEXT Mechanical Handling Exhibition—one of the world's largest displays of all classes of industrial labour-saving and allied equipment—is to be held at Earls Court, London, from May 8-18, 1962. It will be the eighth in the series of this biennial exhibition, which started in 1948. Its growth, both in influence and attendance, reflects the development of industrial mechanization in recent years.

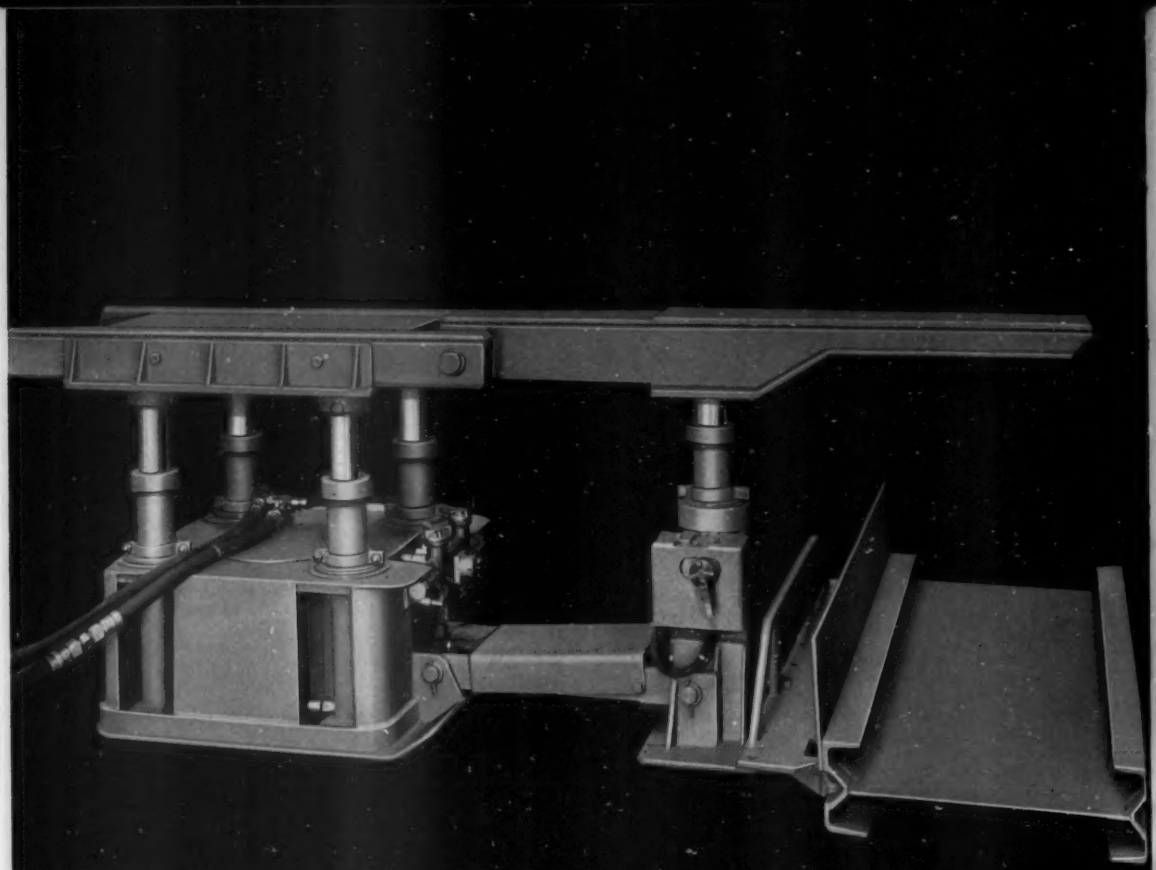
Over 300 firms displayed their products at the 1960 exhibition, occupying 500,000 sq. ft. of space within the hall and extending into the forecourt. A record number of visitors attended the 1960 show, and were able to compare British and foreign equipment, placing orders worth some millions of pounds. Oversea visitors, nearly half as many as on any previous occasion, attended from 77 different countries.

Applications for space in the 1962 show are being received by the organizers, the journal Mechanical Handling. The exhibition is open to manufacturers throughout the world, and full details can be obtained from H. A. Collman, Dorset House, Stamford Street, London, S.E.1.

POSSIBLE BID FOR LINCOLN PUMPMAKERS

PROSPECT of a bid for the shares of William Foster & Company, Limited, threshing-machine makers, of Lincoln, and known for its pumping machinery under its own name and in the name of Gwynnes Pumps, is announced by the directors, who state that negotiations may result in an offer being made. A further announcement is promised soon.

It is four months since the introduction of the company's 5s. ordinary shares. The company has an ordinary capital of £343,845 following £79,905 in 6 per cent. preference. At the current price around 10s., the equity is valued at nearly £690,000.



THE GULLICK-SEAMAN

5 LEGGED HYDRAULIC CHOCK

Strong waste edge support is retained and so good roof control attained; also the valuable safety feature of two rows of support between the operator and the waste edge is retained.

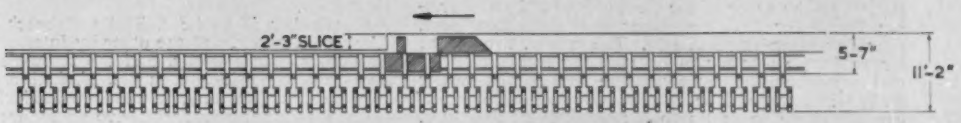
Support close to the conveyor is provided while good bar design ensures a preload to the roof and from the canopy over the conveyor track.

As flexible as 4-legged chocks suitable for seam ranges from 2ft. 10in. to 6ft. 0in.

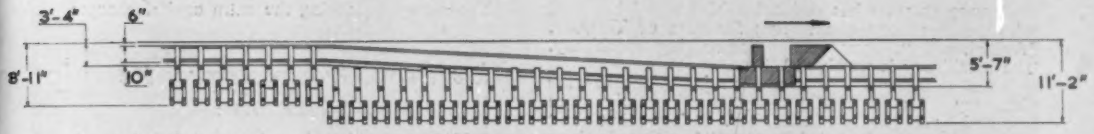
Will work on gradients—special arrangements have been designed for very steep workings.

...considerably increases the scope of power advanced supports.

TYPICAL FACE LAYOUT



FACE DURING CUTTING



FACE WITH MACHINE PLOUGHING BACK

N.B. Distance of front leg to conveyor varies with type of spill plate used.

Distance of face to conveyor varies with type of power loader used.

This support can be used with all types of power loaders taking depth of coal per machine run up to 30in.

Chocks can be set at 3ft. 0in., 3ft. 6in. and 4ft. 0in. centres. Where heavy flushing takes place installation at 3ft. centres is advised.

Under normal conditions chocks can be installed at 3ft. 6in. centres. Cost of installation is then only slightly higher than the standard 4-legged chock installation.

Under exceptionally good conditions this chock can be installed at 4ft. centres.

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Orders Placed

Herbert Morris Cranes For New Power Station

TWO 105-ton overhead electric travelling cranes, the span of each of which is 165 ft., are being supplied by Herbert Morris, Limited, of Loughborough (Leics), to the order of the Central Electricity Generating Board for the new power station at Drakelow, near Burton-on-Trent (Staffs). The cranes, two of the largest in the world, will be used for installing plant and equipment at what will be the biggest power station in Europe. The two cranes, working together, can lift single loads up to a maximum of 200 tons.

Herbert Morris have also supplied the lifting gear for the new 38,000-ton Union Castle passenger liner "Windsor Castle," which recently started her maiden voyage to South Africa.

CZECHOSLOVAKIA has ordered a high speed handmill with ancillary equipment from Stenners of Tiverton, Limited, manufacturers of woodworking machinery. The machinery is worth £10,000.

OTTO continuous catalytic reforming plant for the Guernsey Gas Light Company, has recently been installed by Simon-Carves, Limited. It is the first plant of its type to be installed in the UK, although there are some 28 on the Continent.

HOT lime-base exchange plant and deaerator is to be installed in the Tideway oil refinery, near Copenhagen, by William Boby & Company, Limited, water treatment engineers, of Rickmansworth (Herts). The contract is valued at approximately £11,500.

CONTRACT has been secured by Boving & Company, Limited, London, W.C.2, to supply a fifth 82,500 b.h.p. Pelton turbine for Poatina power station, the first underground power station in Tasmania and part of the Great Lake power development scheme.

FOUR EPICYCLIC GEAR UNITS for motor-driven vertical circulating water pumps for installation in "B" Blyth power station of the Central Electricity Generating Board have been ordered from W. H. Allen, Sons & Company, Limited. The order came from the main contractors, Gwynnes Pumps, Limited.

IN CONNECTION with the Walker's ferry scheme in Nyasaland, a contract has been placed with Richard Costain (Africa), Limited, by the Mudi River Water Board to lay 30 miles of high-pressure pipeline varying from 1 ft. to 2 ft. in diameter. The contract is worth £410,000 and the laying operation will involve several river, road, and railway crossings.

FOUR Brazilian ships being built in foreign shipyards are to be supplied with Denny-Brown stabilizers by Brown Bros. & Company, Limited, Edinburgh, at a cost of about £250,000 each. Two sets of the stabilizers will be made in Scotland by Brown Bros., and the other two sets will be made by German shipyards who recently became manufacturers of the stabilizers under licence.

WITH A BID OF $832,830 (about £297,000) the English Electric Company, Limited, has secured an order for hydraulic turbines for use in Californian reclamation schemes. A similar contract, worth $664,860, was awarded to the Hitachi Company of Japan, but both companies lost other contracts on which they were also low bidders. Mr. N. B. Bennett, assistant commissioner of reclamation, said that it was decided not to award more than one contract to foreign firms because they had not had an opportunity to show what they could do.

CEGB Places £15,000,000 Contracts for Drakelow

CONTRACTS totalling some £15,000,000 are to be placed by the Central Electricity Generating Board for two large super-critical pressure generating units to be installed at Drakelow C power station, near Burton-on-Trent. They will be the first of their kind in Britain.

One boiler is to be built by Babcock & Wilcox, Limited, Renfrew, and the other by International Combustion, Limited, Derby, and the turbo-alternators by Associated Electrical Industries, Limited, and the English Electric Company, Limited, respectively.

Each generating unit will have an output of 375,000 kW. (50,000 h.p.) from a single shaft machine. At full load each boiler will consume about 150 tons of pulverized coal per hour. Although the cost of the units is slightly higher than that of similar size subcritical units they will generate electricity at a lower cost so counterbalancing the extra capital charges.

Coventry Group Apprenticeship Scheme

GROUP apprenticeship scheme designed to give a comprehensive training for indentured apprentices among the smaller and specialist firms was inaugurated by Coventry Chamber of Commerce on Tuesday. It aims to provide facilities to train boys to a standard equal to that offered by large organizations. In the first group, which has started operations, 17 member firms will provide training for craft, technician, and student engineer apprentices in all branches of precision engineering.

Each apprentice will follow a planned practical course in his own company, supplemented by additional experience in other firms of the group. Operation of the scheme will be undertaken by Industrial Administration, (R & A), Limited, of London, which operates and finances the 18 groups of the engineering industries' group apprenticeship scheme.

Miners Most Prone to Illness among British Workers

MINERS are prone to illness almost three times more than the average in England and Wales, according to a report on occupational sick rates published on Wednesday by the General Register Office. Their "patient consulting ratio" (the number of patients in any occupation compared with the average number for all occupations, set at 100) is 288.

Miners also have a high ratio (140) for migraine, but a low one (32) for coronary disease and angina pectoris, and suffer from the common cold almost three times more than the average.

APPLICATION of solar energy for practical purposes in tropical countries is being studied at the Tropical Products Institute's London laboratory. An experimental flat plate collector on the laboratory roof is being used to study the possibilities of heating water and air by the sun's rays. The institute has now published its first annual report since it became part of the Department of Scientific and Industrial Research.

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Photograph of Flämrich Screens by courtesy of the National Coal Board

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CL21

Ruhr Coal Companies Appeal to ECSC Court

COMPLAINT has been laid against the High Authority of the European Coal and Steel Community with the ECSC Court of Justice in Luxembourg by the coal-mining companies of the Ruhr. This is the latest move in the companies' efforts to set up a combined marketing unit, which the High Authority has rejected.

The charge issued by the producers claims that the High Authority based its refusal on false premises and on a false interpretation of the ECSC Charter. The Authority's estimate of the percentage of Ruhr coal in the total ECSC output is also challenged by the companies, as is the decision that certain types of anthracite are comparatively unaffected by competition from oil. The producers claim that the Authority has played down the question of competition in this instance, despite its own reference to "sharp competition" in progress reports on the area.

The Court is considering the companies' case and will have to decide whether the granting of the Ruhr's request would be contrary to Article 65 of the Charter.

Amalgamated Anthracite Shows Improved Profits

AN "improved picture" at the end of 1960 and scope for an increased dividend distribution is predicted by Mr. John Waddell, chairman of Amalgamated Anthracite Holdings, Limited. Profits for the first half of the current year show a useful improvement, he states, and there is no reason why this should not be maintained through the rest of 1960.

This improvement, Mr. Waddell points out, is after allowing for losses in the early part of 1960, although on a diminishing basis, by several of the group's activities "still not completely out of trouble." Certain adverse trading conditions, which the chairman now feels confident have been overcome, materially affected 1959 profits. The consolidated trading balance of the wholly-owned operating subsidiary, British Anthracite, Limited, was £704,955, against £782,218.

Nottinghamshire to Choose Between Coal and Oil

INVESTIGATION is being carried out by Nottinghamshire County Council into the question of the choice between coal and oil heating for all its properties. At present most of the council's buildings are heated by coal, but oil heating has been installed recently at new premises, notably schools.

The chairman of the General Purposes Committee, Ald. F. A. Small, said that as a council in a great coal-producing county, it was obvious that it would like to make its contribution in supporting the industry. "It is not so much that we are thinking about a switch away from coal, as has been the general trend, but rather a switch back to coal," he said. He added that the council had turned to oil for some of its schools when coal was scarce.

While discussions are going on, the East Midlands Divisional Coal Board has distributed its booklet, "Solid Fuel: The Modern Way" to every member of the county council.

Coal Stocks Position

DETAILS of coal stocks as at August 6, 1960, compared with those available at August 8, 1959, are given in the appended table issued by the Ministry of Power.

Figures in parentheses, mainly calculated on the basis of requirements during the winter, indicate the total weeks which the tonnage in stock would last.

Week ended:—	Aug. 6, 1960.	Aug. 8, 1959.
	Thous. tons.	Thous. tons.
Distributed stocks—		
Public-utility undertakings—		
Gas	2,037 (4.0)	2,486 (4.6)
Electricity	5,956 (5.1)	6,825 (6.0)
Railways	492 (2.4)	522 (2.5)
Coke ovens	1,299 (2.5)	1,166 (2.4)
Industrial consumers—		
Iron and steel	199 (1.7)	192 (1.7)
Engineering and other metal industries	268 (3.0)	316 (3.5)
Other industries	1,706 (3.0)	1,860 (3.5)
TOTAL INDUSTRIES	2,173	2,368
Merchants' stocks—		
(*a*) House coal	1,131	1,336
(*b*) Anthracite and boiler fuel	183	171
Miscellaneous (estimated)	285	376
TOTAL DISTRIBUTED STOCKS	13,556	15,250
Undistributed stocks—		
At collieries (on ground and in wagons)	27,940	23,658
At open-cast sites	6,523	6,642
TOTAL UNDISTRIBUTED STOCKS	34,463	30,300

Coal Chartering

COAL market from Hampton Roads has been particularly quiet, although subject to stem there are prospects of business to the Continent at 24s., possibly a little more, but owners show no particular keenness to fix. Tonnage has again been fixed for Japanese discharge, two large vessels being fixed to full range at $8.20 and $8.10 respectively, and 10,000 tons for end of August/September 30 to Moji-Chiba Range at $8.30. There is a small interest to South America with 11,000 tons arranged for Buenos Aires for September 12/25 at $5.90 and with options. Roads/Yugoslavia reports a 20,000-tonner for August at $4.40.

There is a miscellaneous demand from the Continental ports to various destinations including Mediterranean, and Poland/West Italy paid 24s. for 9,500 tons, August. Chartering from the UK is also quiet but Cardiff/West Italy reports 4,500 tons at 24s. 9d. for August 25 and 4,600 tons at 3d. less for middle of October. Tonnage moves off reasonably freely in the coasting trade and Swansea/St. Malo reports 500 tons at 19s., 700 tons to Antwerp at 13s. 9d., and 650 tons to Quimper at 17s. 6d., all for prompt loading.

Mr. CHARLES DODD has been appointed to fill the new post of Press officer to the Cementation group of companies. Previously he held a similar appointment with the British Oxygen group.